

CATALOGUE OF THE COLLECTION OF RECENT ECHINI IN THE
UNITED STATES NATIONAL MUSEUM (CORRECTED TO JULY 1,
1886).

By RICHARD RATHBUN.

INTRODUCTION.

The following catalogue is published for a twofold purpose. First, in order to secure a permanent record of the species and specimens of Echini contained in the U. S. National Museum, which have now, with few exceptions, been completely identified and labeled; and second, to present in convenient form for reference such data as that collection affords respecting the distribution of the numerous members of that group.

The National Museum collection of Echini is second, in this country, only to that of the Museum of Comparative Zoology, at Harvard College, both in size and comprehensiveness, but we have no means of comparing it with European collections, although it is probably excelled by few, if any, in the old world. It now contains 152 species that have been determined, but many species are represented by large series of specimens, covering a wide range of distribution, both geographical and bathymetrical, and thus affording excellent opportunities for the study of variation under different conditions of environment. The materials composing this collection have been derived from many sources, and credit is given in the list to all contributors, but a few of these are deserving of special mention.

The most important contributions have been made by the U. S. Fish Commission, beginning in 1871 and continuing down to date. The explorations of this Commission have extended along the eastern coast of North America, from the Grand Bank of Newfoundland to the northern coast of South America, and from the littoral zone into the deepest water yet recorded off the Atlantic coast of the United States. At the south, they have covered a large part of the Gulf of Mexico and Caribbean Sea, including the shores of several of the West Indian Islands and the Bahamas. Interesting specimens from the fishing banks of Eastern North America have been received, through the Commission, from the Gloucester fishermen, many of whom were constantly engaged in making collections in its behalf, from 1878 to 1880. Not all of the Echini collected by the Fish Commission have yet been turned over to the Museum, but representatives of nearly all the species obtained and the bulk of the specimens have already been sent in. The number of species with which the Commission is credited on the following pages is 54.

Of the interesting deep-sea collections made by the U. S. Coast Survey steamer Blake, under the supervision of Mr. Alexander Agassiz, off the eastern coast of the United States, and in the Gulf of Mexico and

Caribbean Sea, from 1877 to 1880, the Museum has received a nearly complete series of all the species. Many specimens have also been obtained from the southern and western coasts of Florida by Mr. Henry Hemphill and Dr. Edward Palmer, who spent considerable time in that region, in the service of the Museum, from 1883 to 1885.

For Alaskan Echini the Museum is chiefly indebted to Mr. William H. Dall, who, during his several visits to Alaska and the adjacent waters of Siberia, made very extensive collections both from the shore and by dredging, thereby securing an exceedingly large number of specimens of this group. Other materials from the Alaskan region have been sent in by observers of the U. S. Signal Service, by the officers of the U. S. revenue steamer *Corwin*, and by several naval officers.

From the western coast of North America south of Alaska, valuable specimens have been contributed by Mr. J. G. Swan, from Puget Sound, Neeah Bay, and British Columbia; by Prof. D. S. Jordan, while in the service of the U. S. Fish Commission, from Washington Territory and California; by Mr. A. Forrer and Prof. R. E. C. Stearns, from California, Lower California, and Mexico; by Mr. John Xantus and Mr. L. Belding, from Lower California and Mexico; and by Lieut. Commander H. E. Nichols, U. S. N., from various sources. The collection of Echini obtained by Mr. John Xantus at the southern extremity of California was, at the time it was made (1859 to 1861), one of the most important that had been procured from that region, and a large number of his specimens are still preserved in the Museum in good condition.

So far as the writer is aware, no account has ever been published of the collection of Echini made by the Wilkes United States Exploring Expedition around the world, from 1838 to 1842, and it is now impossible to determine how extensive that collection may have been. The very valuable zoological materials obtained on that cruise, including the Crustacea and Zoophytes described by Dana and the Mollusks described by Gould, did not come into the possession of the Museum until several years after they left the hands of the naturalists engaged in studying them, and in the mean time they suffered greatly from the destruction of specimens and the loss of labels, due to insufficient accommodations in the store rooms in which they were kept. They received further damage at the time of the Smithsonian fire in 1865, and at the burning of the museum of the Chicago Academy of Science in 1871. Only a few specimens of Echini that can be referred to that Expedition have been found in the Museum collection, and these are all denuded tests, mostly without other indication of their origin than the simple inscription "U. S. Ex. Ex.," written directly upon the specimen.

The Echini collected by the North Pacific Exploring Expedition, Dr. William Stimpson naturalist, from 1853 to 1856, fared somewhat better, notwithstanding the fact that the Crustaceans and Mollusks were almost entirely destroyed in the great Chicago fire above referred to. This expedition visited numerous islands in the Pacific Ocean, and the eastern coast of Asia as far north as Kamtchatka and Bering Strait;

but marine collecting was limited to the littoral zone and the shallow waters near shore. The Echini were described by Mr. Alexander Agassiz in the following paper:

Synopsis of the Echinoids collected by Dr. W. Stimpson on the North Pacific Exploring Expedition, under the command of Captains Ringgold and Rodgers. Jour. Acad. Nat. Sci. Phila., 1863, pp. 352-361.

Forty-three species in all were enumerated, and a few new species described. Two of these species have since been regarded as varieties of others contained in the same list, reducing the total number to 41. Of this collection only 27 species are now positively known to be in the National Museum, although specimens of some of the other species have since been received from other sources. Following is a corrected list of the species mentioned by Mr. Agassiz, those in italics being still in the museum:

<i>Phyllacanthus dubia.</i>	<i>Temnopleurus Hardwickii.</i>
<i>imperialis.</i>	Temnopleurus Reynaudi.
<i>Arbacia pustulosa.</i>	<i>toreumaticus.</i>
<i>Diadema setosum.</i>	<i>Microcyphus maculatus.</i>
Centrostephanus Rodgersii.	<i>Mespilia globulus.</i>
<i>Echinothrix turcarum.</i>	<i>Phymosoma crenulare.</i>
<i>Colobocentrotus atratus.</i>	Echinus angulosus.
<i>Mertensii.</i>	<i>Hipponoë variegata.</i>
<i>Heterocentrotus mammillatus.</i>	Echinocyamus pusillus.
<i>Echinometra lucunter.</i>	Fibularia australis.
<i>Parasalenia gratiosa.</i>	<i>Laganum Putnami.</i>
<i>Strongylocentrotus depressus.</i>	<i>Peronella decagonalis.</i>
<i>Dröbachiensis.</i>	Echinarachnius mirabilis.
<i>eurythrogrammus.</i>	<i>parma.</i>
<i>globulosus.</i>	Echinodiscus lævis.
<i>intermedius.</i>	Rotula Rumphii.
<i>nudus.</i>	Maretia alta.
<i>purpuratus.</i>	Lovenia subcarinata.
<i>tuberculatus.</i>	Echinocardium australe.
<i>Sphærechinus granularis.</i>	Paleostoma mirabilis.
<i>puleherrimus.</i>	

During the past few years, very valuable contributions of Echini have been made by Dr. W. H. Jones, U. S. N., from the islands of the Central and Southern Pacific Ocean, and the west coast of South America, including the Galapagos Islands. The collections received from Dr. Jones have been mainly preserved in alcohol, and include many fine and carefully prepared specimens. Several interesting species from China and Japan have been received from Dr. F. C. Dale, U. S. N., and Mr. P. L. Joly, naturalists of the U. S. S. Palos, surveying in those waters, and small collections have been donated from time to time by other naval officers stationed in foreign countries.

European materials have been obtained mostly by exchange with the Bergen Museum, Norway, the Rev. A. M. Norman, of England, and Prof. C. Möbius, of Kiel, Germany.

The synonymy of the species of Echini has been published in such detail by Mr. Alexander Agassiz that it has been deemed inexpedient

to give in this list more than the name by which each species is now designated, together with the authority for the combination used. The classification and nomenclature of Mr. Agassiz have been strictly followed, and those who desire further information on the subject are referred to the following monographs by that author:

Revision of the Echini. Illustrated Catalogue of the Museum of Comparative Zoology, at Harvard College, No. VII. Memoirs, Mus. Comp. Zool., vol. iii. In four parts, text and plates. Cambridge, 1872-'74.

Reports on the Results of Dredging, under the supervision of Alexander Agassiz, in the Gulf of Mexico (1877-'78), in the Caribbean Sea (1878-'79), and along the Atlantic Coast of the United States (1880), by the U. S. Coast Survey steamer "Blake," Lieut.-Com. C. D. Sigsbee, U. S. N., and Commander J. R. Bartlett, U. S. N., commanding. XXIV. Part I. Report on the Echini. By Alexander Agassiz. Mem. Mus. Comp. Zool., vol. x, No. 1, pp. 1-94, 32 plates, 1883.

Report on the Scientific Results of the Voyage of H. M. S. Challenger during the years 1873-'76. Zoology. Vol. iii. Part ix. Report on the Echinoidea. 1881.

Notes are given with only a few species, as the greater part of the material contained in the collection has already been discussed in one connection or another, though mostly in brief reports covering special collections or limited faunal regions. The report upon the Echini of the North Pacific Exploring Expedition, by Mr. Agassiz, has been mentioned above. Subsequently Mr. Agassiz examined the entire collection of Echini belonging to the National Museum, in connection with the preparation of his "Revision of the Echini," in which many references to this collection will be found. The Blake Echini are described in the second monograph of Mr. Agassiz, above cited. Prof. A. E. Verrill has described or noticed all the species collected by the U. S. Fish Commission on the Atlantic coast of the United States, north of Cape Hatteras, in numerous papers, each generally covering the explorations of a single season. In the following report to the U. S. Fish Commissioner, Professor Verrill has fully discussed the species known from the Southern New England coast up to 1872:

Report upon the Invertebrate Animals of Vineyard Sound and Adjacent Waters, etc. Report U. S. Comm. Fish and Fisheries, Part I, for 1871 and 1872 (1874), pp. 295-478.

The subsequent notices of Echini by Professor Verrill have mostly appeared in the American Journal of Science since 1872, in the series of papers entitled "Brief Contributions to Zoology from the Museum of Yale College." These have been mainly devoted to preliminary accounts of the explorations of the Fish Commission from year to year, with brief descriptions of the marine invertebrates.

The Echini collected by the Fish Commission in the Gulf of Mexico and Caribbean Sea have been noticed by the writer in the last volume of these Proceedings, as follows:

Report upon the Echini collected by the United States Fish Commission steamer Albatross in the Caribbean Sea and Gulf of Mexico, January to May, 1884. By Richard Rathbun. Proc. U. S. Nat. Mus., viii, pp. 83-89, 1885.

Report upon the Echini collected by the U. S. Fish Commission steamer Albatross in the Gulf of Mexico, from January to March, 1885. By Richard Rathbun. Proc. U. S. Nat. Mus., viii, pp. 606-620, 1885.

An important work of reference with respect to the Echini of the west coast of America is the following by Prof. A. E. Verrill:

Notes on the Radiata in the Museum of Yale College, with Descriptions of new Genera and Species. Trans. Conn. Acad. Arts and Sci., vol. i, part 2, pp. 247-613, pls. iv-x, 1867-'71.

In the present catalogue, the arrangement of the record of specimens under each species is mainly in accordance with the plan that has generally been followed by the Departments of Fishes and Marine Invertebrates in preparing National Museum lists, excepting that the writer has found it more convenient for reference to place the Museum catalogue numbers at the end of each entry, inclosed in parentheses, instead of before it. The entries are arranged geographically from the north toward the south, and are frequently grouped under a few geographical headings to facilitate reference and to permit of brevity. Where species are represented from the Atlantic coasts of both Europe and America, the specimens from the former country are first recorded; and where, as in the case of *Strongylocentrotus Dröbachiensis*, we have species common to both the Atlantic and Pacific Oceans, the former region is given preference over the latter in the list.

With the Fish Commission specimens, the locality is generally given first, followed by the depth of water, the character of the bottom, the number of the dredging station, and, finally, the National Museum catalogue number. Where specimens are combined from several stations, this order is not always followed.

The following general abbreviations have been used: U. S. Fish Comm., for U. S. Fish Commission; U. S. Expl. Exped., for the Wilkes United States Exploring Expedition; N. Pac. Expl. Exped., for the North Pacific Exploring Expedition; Mus. Comp. Zool., for the Museum of Comparative Zoology at Harvard College; fath., for fathoms; sta., for station.

The abbreviations employed to designate the character of the bottom immediately following the depth of water are explained in the following table:

Materials.	Colors.	Other qualities.
C. for clay.	bk. for black.	brk. for broken.
Cr. for coral.	bn. for brown.	crs. for coarse.
F. for foraminifera.	bu. for blue.	fne. for fine.
G. for gravel.	dk. for dark.	glb. for globigerina.
M. for mud.	gn. for green.	hrd. for hard.
O. for ooze.	gy. for gray.	rky. for rocky.
P. for pebbles.	lt. for light.	sft. for soft.
R. for rocks.	rd. for red.	sml. for small.
S. for sand.	wh. for white.	
Sh. for shells.		
Spg. for sponges.		
St. for stones.		

The writer is under many obligations to Mr. Alexander Agassiz for the opportunity of making comparisons with the unrivaled collection of Echini at the Museum of Comparative Zoology, and for personal assistance in identifying several difficult species. He is also greatly indebted to Mr. J. Walter Fewkes, of the same museum, for kind assistance in his work at the time of making these comparisons.

C A T A L O G U E .

Suborder DESMOSTICHA Hæckel.

Family CIDARIDÆ Müller.

Subfamily GONIOCIDARIDÆ Hæckel.

CIDARIS Klein.

1. *Cidaris metularia* Blainville.

Zanzibar, Africa; Cheney, Mus. Comp. Zoology (3589).

Unknown locality (3439).

2. *Cidaris Thouarsii* Valenciennes.

Puerto Balandre, Gulf of California; W. J. Fisher, Stearns's Coll. (10007).

Lower California:

La Paz; L. Belding (5391); A. Forrer, 1885 (10011).

Cape St. Lucas; John Xantus (2470, 3488).

Western coast of Mexico; A. Dugés (12580).

Panama; Sternberg (2363, 2364, 2365, 2366, 2369); Capt. J. M. Dow ? (3541).

Chatham Island, Galapagos Islands; Dr. W. H. Jones, U. S. N., 1884 (8730, 8748).

West coast of North America; Lieut. Comdr. H. E. Nichols, U. S. N., 1881 (6744).

3. *Cidaris tribuloides* Blainville.

Nassau, New Providence, Bahamas; U. S. Fish Comm., 1886 (14528).

Florida (2473); Indian Key, Hemphill (14309); Key Vaccas, Hemphill (14310).

Off Key West, Florida; U. S. Fish Comm., 1885:

Lat. $24^{\circ} 25' 30''$ N., long. $81^{\circ} 47' 45''$ W., 50 fath.; sta. 2316 (10703).

Lat. $24^{\circ} 26' N.$, long. $81^{\circ} 48' 15'' W.$, 37 fath., Cr.; sta. 2315 (10702).

Lat. $25^{\circ} 04' 30'' N.$, long. $82^{\circ} 59' 15'' W.$, 26 fath., S.; sta. 2414 (10698).

Off the Dry Tortugas, Florida; U. S. Coast Survey str. Blake, A. Agassiz, 1877-78:

Lat. $24^{\circ} 43' N.$, long. $83^{\circ} 25' W.$, 37 fath.; sta. 11 (6824).

Lat. $24^{\circ} 34' N.$, long. $83^{\circ} 16' W.$, 36 fath.; sta. 12 (6795).

Off Havana, Cuba; U. S. Fish Comm., 1885:

Sta. 2324, 33 fath., Cr. (10701).

Sta. 2342, 201 fath., Cr. (10755).

Gulf of Mexico; U. S. Fish Comm., 1885:

Lat. $28^{\circ} 28'$ to $28^{\circ} 45' N.$, long. $84^{\circ} 25'$ to $85^{\circ} 02' W.$, 21-30 fath., S. Cr.; sta. 2405, 2407, 2408 (10699, 10734).

Lat. $29^{\circ} 11' 30''$ to $29^{\circ} 15' 30'' N.$, long. $85^{\circ} 29'$ to $85^{\circ} 29' 30'' W.$, 25-27 fath., S. G. Cr.; sta. 2372, 2373, 2374 (10697, 10754).

Off Cape Catoche, Yucatan; lat. $22^{\circ} 07' 30'' N.$, long. $87^{\circ} 06' W.$, 21 fath., Cr.; U. S. Fish Comm., sta. 2363, 1885 (10700).

Albatross Bank, off Jamaica; lat. $17^{\circ} 44' 05'' N.$, long. $75^{\circ} 39' W.$, 23 fath., Cr., brk. Sh.; U. S. Fish Comm., sta. 2138, 1884 (7479).

St. Thomas, West Indies, shore; U. S. Fish Comm., 1884 (8390).

Sabanilla, U. S. of Colombia, shore; U. S. Fish Comm., 1884 (8391, 8612).

Off Aspinwall, Panama; lat. $9^{\circ} 32' N.$, long. $79^{\circ} 54' 30'' W.$, 34 fath., brk. Sh.; U. S. Fish Comm., sta. 2146, 1884 (7489).

Caledonia Bay, Panama (5176).

DOROCIDARIS A. Agassiz.

4. *Dorocidaris Bartletti* A. Agassiz.

Off Havana, Cuba; U. S. Fish Comm., 1885; stations 2320, 2322, 2324, 2325, 2327, 2330, 2331, 2334, 2335, 2337, 2349; 33 to 204 fath., Cr. S. (10659 10660, 10661, 10662, 10707); 1886 (14584).

Albatross Bank, off Jamaica; lat $17^{\circ} 44' 05''$ N., long. $75^{\circ} 39'$ W., 23 fath., Cr. brk. Sh.; U. S. Fish Comm., sta. 2138, 1884 (7479).

Off the Windward Islands; U. S. Coast Survey str. Blake, A. Agassiz, 1878-'79: Off Barbados, 94 fath., sta. 276 (6836).

Off Montserrat, 88 fath., sta. 155 (6832).

5. *Dorocidaris Blakei* A. Agassiz.

North of Little Bahama Bank; lat. $27^{\circ} 22'$ N., long. $78^{\circ} 07' 30''$ W., 338 fath., gy. S.; U. S. Fish Comm., sta. 2655, 1886 (14585). A fine series, in perfect condition.

Off Havana, Cuba; U. S. Fish Comm., 1884:

Sta. 2152, 387 fath., Cr. (7484).

Sta. 2153, 283 fath., Cr. (7481).

Sta. 2162, 122 fath., Cr. (7486).

South of Cuba; U. S. Fish Comm., 1884:

Lat. $19^{\circ} 55' 46''$ N., long. $75^{\circ} 49' 23''$ W., 400 fath., M. fine. S.; sta. 2128 (7487).

Lat. $19^{\circ} 56' 06''$ N., long. $75^{\circ} 47' 32''$ W., 254 fath.; sta. 2134 (7483).

Off Barbados, Windward Islands, 200 fath.; U. S. Coast Survey str. Blake, A. Agassiz, 1878-'79 (6833).

6. *Dorocidaris papillata* A. Agassiz.

Atlantic Ocean, off the Capes of Delaware; lat. $38^{\circ} 39'$ N., long. $73^{\circ} 11'$ W., 130 fath., S.; U. S. Fish Comm., sta. 1043, 1881 (5080, 7615).

Atlantic Ocean, off South Carolina; lat. $32^{\circ} 33' 15''$ N., long. $77^{\circ} 30' 10''$ W., 257 fath.; U. S. Coast Survey str. Blake, A. Agassiz, sta. 320, 1880 (6835).

Atlantic Ocean, off South Carolina and Georgia; U. S. Fish Comm., 1885:

Lat. $32^{\circ} 35'$ N., long. $77^{\circ} 30'$ W., 247 fath., gy. S.; sta. 2625 (12938).

Lat. $30^{\circ} 44'$ N., long. $79^{\circ} 26'$ W., 440 fath., S.; sta. 2415 (10756).

Off the east coast of Florida; U. S. Fish Comm., 1886:

Lat. $31^{\circ} 09'$ N., long. $79^{\circ} 33' 30''$ W., 352 fath., gy. S., Cr. brk.; sta. 2669 (14590).

Lat. $30^{\circ} 58' 30''$ N., long. $79^{\circ} 38' 30''$ W., 294 fath., gy. S., brk. Cr.; sta. 2668 (14588).

Lat. $30^{\circ} 47' 30''$ N., long. $79^{\circ} 49'$ W., 270 fath., gy. S.; sta. 2666 (14586).

Lat. $29^{\circ} 16' 30''$ N., long. $79^{\circ} 36' 30''$ W., 438 fath., gy. S.; sta. 2661 (14591).

Off Havana, Cuba; U. S. Fish Comm., 1884-'85:

Sta. 2152, 2154, 2157, 2161, 2162; 29-387 fath., Cr. (7476, 7478, 7482, 7485, 7488).

Sta. 2319, 2322, 2324, 2327, 2336, 2337, 2342, 2345-2349; 33-230 fath., S. Cr. (10710).

Sta. 2323, 163 fath., Cr. (10709).

Sta. 2341, 143 fath., Cr. (10708).

Off Havana, 1886 (14589).

South of Cuba; U. S. Fish Comm., 1884:

Lat. $19^{\circ} 56' 04''$ N., long. $75^{\circ} 48' 55''$ W., 274 fath., M. fine. S., sta. 2129 (7480); 254 fath., sta. 2134 (12948).

6. *Dorocidaris papillata* A. Agassiz—Continued.

Lat. $19^{\circ} 55' 58''$ N., long. $75^{\circ} 47' 07''$ W., 250 fath., Cr.; sta. 2135 (7477, 10753).

Off Sta. Lucia, Windward Islands, 164 fath.; U. S. Coast Survey str. Blake, A. Agassiz, sta. 218, 1878-79 (6834).

Unknown locality; probably Mediterranean Sea (3571).

Dorocidaris papillata, var.*

Off the coast of the Southern Atlantic States; U. S. Fish Comm., 1884, 1885:

Off Chesapeake Bay, 104 fath., S. M. G.; sta. 2420 (10714).

Off Cape Hatteras, North Carolina, 48-68 fath., M. S.; sta. 2268 (8318, 10061), sta. 2269 (8317, 10063), sta. 2301 (8316, 10062), sta. 2596 (12937).

Between Capes Hatteras and Lookout, 15-107 fath., gy. S. P.; sta. 2597 (12870), sta. 2601 (12945).

Off Cape Fear, North Carolina, 90 fath., S.; sta. 2418 (10053).

Gulf of Mexico, U. S. Fish Comm., 1885:

Off Key West, Fla., 45-50 fath., Cr.; sta. 2316, 2317, 2318 (10051, 10052, 10712).

Off Havana, Cuba, 67 fath., Cr.; sta. 2334 (10713).

Off the west end of Cuba, 426 fath.; sta. 2351 (10711).

Off Cape San Blas, Florida, 25-27 fath., G. Cr.; sta. 2372, 2373 (10715).

PHYLLACANTHUS Brandt.

7. *Phyllacanthus annulifera* A. Agassiz.

Port Lloyd, Bonin Islands; W. J. Fisher, coll. of W. H. Dall (14032).

8. *Phyllacanthus dubia* Brandt.

Port Lloyd, Bonin Islands; among the branches of corals, in one fathom of water; William Stimpson, North Pacific Expl. Exped., 1854 (2487).

9. *Phyllacanthus gigantea* A. Agassiz.

Sandwich Islands; J. K. Townsend (3554).

10. *Phyllacanthus imperialis* Brandt.

Gaspar Straits, Malay Archipelago; W. Stimpson, N. Pa. Expl. Exped. (3135).

POROCIDARIS Desor.

11. *Porocidaris Sharreri* A. Agassiz.

Atlantic Ocean, off North Carolina and Florida; U. S. Fish Comm., 1885:

Lat. $34^{\circ} 39' 15''$ N., long. $75^{\circ} 33' 30''$ W., 107 fath., gy. S. P.; sta. 2601 (12944).

Lat. $30^{\circ} 44'$ N., long. $79^{\circ} 26'$ W., 440 fath., S. F.; sta. 2415 (10704).

Off Havana, Cuba; U. S. Fish Comm., 1885:

Sta. 2337, 2338, 2341; 143-199 fath., Cr. (10716).

Sta. 2345, 184 fath., Cr. (10706).

Sta. 2348, 211 fath., Cr. (10705).

Off Havana, 1886 (14583).

Off Yucatan; U. S. Fish Comm., 1885:

Off Cape Catoche; lat. $22^{\circ} 08' 30''$ N., long. $86^{\circ} 49'$ W., 26 fath., Cr.; sta., 2360 (10716).

Off Arrowsmith Bank; lat. $26^{\circ} 59' 30''$ N., long. $86^{\circ} 23' 45''$ W., 130 fath., Cr.; sta. 2354 (10717).

Off Nevis, Windward Islands, 356 fath.; U. S. Coast Survey str. Blake, A. Agassiz, sta. 151, 1878-79 (6810).

* A. Agassiz, Revision of the Echini, 1872, p. 256.

This species has not been recorded hitherto from north of the latitude of Fernandina, Fla.

GONIOCIDARIS Desor.

12. *Goniocidaris canaliculata* A. Agassiz.

Rose Island, Navigator Group; U. S. Expl. Exped. (3569).

Subfamily SALENIDÆ Agassiz.

SALENIA Gray.

13. *Salenia Pattersoni* A. Agassiz.

Off Montserrat, West Indies, 148 fath.; U. S. Coast Survey str. Blake, A. Agassiz, 1878-'79 (6787).

Off Havana, Cuba, 242 fath.; U. S. Coast Survey str. Blake, A. Agassiz, 1877-'78 (6805).

Off Havana, Cuba, 67-279 fath.; U. S. Fish Comm., 1884-'85, 20 stations (7049, 7050, 7051, 7052, 8404, 8405, 10649, 10651, 10652); 1886 (14581).

14. *Salenia varispina* A. Agassiz.

Off the East Coast of Florida; U. S. Fish Comm., 1886:

Lat. $30^{\circ} 53' N.$, long. $79^{\circ} 42' 30'' W.$, 273 fath., gy. S.; sta. 2667 (14579).

Lat. $30^{\circ} 47' 30'' N.$, long. $79^{\circ} 49' W.$, 270 fath., gy. S.; sta. 2666 (14578).

Lat. $29^{\circ} 41' N.$, long. $79^{\circ} 55' W.$, 373 fath., Cr. S.; sta. 2664 (14580).

Lat. $29^{\circ} 16' 30'' N.$, long. $79^{\circ} 36' 30'' W.$, 438 fath., gy. S.; sta. 2661 (14576).

Mouth of Exuma Sound, Bahama Islands; lat. $23^{\circ} 48' 40'' N.$, long. $75^{\circ} 10' 40'' W.$, 1169 fath., Cr. S.; U. S. Fish Comm., sta. 2629, 1886 (14577).

Southeast of Cuba; lat. $19^{\circ} 07' N.$, long. $74^{\circ} 52' W.$, 1,200 fath.; U. S. Coast Survey str. Blake, A. Agassiz, 1878-'79 (6799).

Caribbean Sea; U. S. Fish Comm., 1884:

Lat. $15^{\circ} 24' 40'' N.$, long. $63^{\circ} 31' 30'' W.$, 683 fath., M. fne. S.; sta. 2117 (8402).

Lat. $13^{\circ} 32' 40'' N.$, long. $62^{\circ} 54' W.$, 690 fath., M. S.; sta. 2118 (8401).

Lat. $19^{\circ} 45' N.$, long. $75^{\circ} 04' W.$, 1,639 fath., M.; sta. 2127 (8403).

Off Barbados, West Indies, 399 fath.; U. S. Coast Survey str. Blake, A. Agassiz, 1878-'79 (6789).

Family ARBACIADÆ Gray.

ARBACIA Gray.

15. *Arbacia nigra* A. Agassiz.

Peru; Dr. W. H. Jones, U. S. N., 1884:

Pacasamayo; stones, 5 to 6 feet of water (8727).

San Lorenzo Island, Callão Bay side; low water, rocks and sand (8752).

Peru (8736).

Valparaiso, Chili (3244).

"Pacific Is." ? (3502).

Unknown localities (2666, 3452, 3453, 3454, 3619).

16. *Arbacia punctulata* Gray.

Southern New England:

Naushon Island, Mass.; Mus. Comp. Zool. (3430).

Near New Bedford, Mass. (3445).

16. *Arbacia punctulata* Gray—Continued.

Southern New England; U. S. Fish Comm.:

Vineyard Sound, Mass. (many stations).

Newport, R. I., shore (5035).

Narragansett Bay, R. I., 4-14½ fathoms (7037, 9617, 9618).

Noank, Conn. (3761, 5077, 13702).

Off Noank, Conn. (6957).

Middle Atlantic coast, United States; U. S. Fish Comm., 1883-'85:

Off Chesapeake Bay, 19 fath., fine. S. Sh.; sta. 2016 (8386).

Off Cape Hatteras, N. C., 13-27 fath., S. G. (5 stations).

Off Cape Lookout, N. C., 22-168 fath., S.; sta. 2608, 2609, 2614 (12873, 12875, 14028).

Middle Sound, near Wilmington, N. C.; R. E. Earll, 1880 (3795).

Blackfish Bank, off Charleston, S. C.; R. E. Earll, 1880 (8666).

South Carolina; William Stimpson (3522).

Florida:

Mouth of Saint Mary's River; U. S. Fish Comm., 1884 (8722).

Fernandina (3586).

Saint Augustine; Postell (3556).

Georgiana; William Wittfield (12868).

Indian River; G. Wurdemann (3518).

East Coast; General Spinner (10064).

Eastern Dry Rocks, near Key West; Dr. E. Palmer, 1884 (8729).

Charlotte Harbor; G. W. Mastin (2458).

Little Sarasota Bay; Meek (8616); Henry Hemphill, 1884 (8676).

Pine Key, outer shore; Henry Hemphill, 1884 (8617).

Marco (8657).

Gulf of Mexico; U. S. Fish Comm., 1885:

Off Charlotte Harbor, Fla., 24-27 fath., S.; sta. 2412, 2413 (10658).

Off Tampa Bay, Fla., 26 fath., crs. S.; sta. 2409 (10657).

Off Apalachicola, Fla., 21-30 fath., S. G.; sta. 2369-2373 (10656); sta. 2405-2408 (10657).

Off Cape Catoche, Yucatan, 21-25 fath., S. Cr.; sta. 2362-2365 (10655).

17. *Arbacia pustulosa* Gray.

Madeira; William Stimpson, N. Pac. Expl. Exped. (1777, 2496, 3500).

Unknown locality (3498).

18. *Arbacia spatuligera* A. Agassiz.

Peru; Dr. W. H. Jones, U. S. N., 1884 (8713).

San Lorenzo Island (8751).

Unknown localities (3434, 3444, 3448).

19. *Arbacia stellata* Gray.

Lower California:

William Stimpson ? (3588).

La Paz; W. J. Fisher, Stearns's Coll. (8991).

Gulf of California (?); Stearns's Coll. (10003).

Guaymas, Mexico; Captain Stone (2399, 2400).

Panama; Edwards (2461).

West Coast of North America; Lieut. Comdr. H. E. Nichols, U. S. N., 1881 (6742).

PODOCIDARIS A. Agassiz.**20. *Podocidaris sculpta* A. Agassiz.**

Off Fernandina, Florida; U. S. Fish Comm., 1886:

Lat. 30° 58' 30" N., long. 79° 38' 30" W., 294 fath., gy. S. brk. Cr.; sta. 2668 (14542).

Lat. 30° 47' 30" N., long. 79° 49' W., 270 fath., gy. S.; sta. 2666 (14543).

CÆLOPLEURUS Agassiz.

21. *Cœlopleurus floridanus* A. Agassiz.

- Off Cape Hatteras, N. C. ; lat. $35^{\circ} 08' 50''$ N., long. $75^{\circ} 07' 20''$ W., 68 fath., M. S. ; U. S. Fish Comm., sta. 2267, 1884 (12345).
 Off Cape Lookout, N. C. ; lat. $34^{\circ} 39' 15''$ N., long. $75^{\circ} 33' 30''$ W., 107 fath., gy. S. P. ; U. S. Fish Comm., sta. 2601, 1885 (14302).
 Off Cape Fear, N. C. ; lat. $33^{\circ} 33'$ N., long. $77^{\circ} 36'$ W., 15 fath., gy. S. brk. Cr. ; U. S. Fish Comm., sta. 2622, 1885 (12943).
 Off Key West, Florida ; lat. $24^{\circ} 25' 30''$ N., long. $81^{\circ} 47' 45''$ W., 50 fath. ; U. S. Fish Comm., sta. 2316, 1885 (10653).
 Off Havana, Cuba ; lat. $23^{\circ} 09' 30''$ N., long. $82^{\circ} 21' 30''$ W., 242 fath. ; U. S. Coast Survey str. Blake, A. Agassiz, sta. 11, 1877-'78 (6798).
 Off Havana, Cuba ; U. S. Fish Comm., 1884-'85 :
 Sta. 2164, 192 fath., Cr. (7048).
 Sta. 2166, 196 fath., Cr. (7047).
 Sta. 2167, 201 fath., Cr. (8398).
 Sta. 2319-2348, 67-216 fath., Cr. S. (10654).
 Off Havana, 1886 (14582).
 Off the Windward Islands ; U. S. Coast Survey str. Blake, A. Agassiz, 1878-'79 :
 Off Barbados, 73-82 fath., sta. 290, 293 (6786, 6804).
 Off Montserrat, 88 fath., sta. 155 (6794).
 Lat. $23^{\circ} 52'$ N., long. $88^{\circ} 05'$ W., 95 fath. ; U. S. Coast Survey str. Blake, A. Agassiz, sta. 32, 1877-'78 (6801).

The specimens of this species from station 2267 (12345), and station 2622 (12943) are all much larger than any described from the Gulf of Mexico, one of the largest measuring about 50^{mm} in diameter. The spines sometimes attain a length of over 130^{mm}. This species is here recorded for the first time from north of the Gulf of Mexico.

Family DIADEMATIDÆ Peters.

DIADEMA Schynvoet.

22. *Diadema mexicanum* A. Agassiz.

Lower California :

- La Paz ; L. Belding (5393).
 Cape St. Lucas ; John Xantus (3246, 3558).
 St. Josef Island, Gulf of California ; W. J. Fisher, Stearns's Coll. (10006).
 Acapulco, Mexico ; A. Agassiz (3467).

23. *Diadema setosum* Gray.

- Nassau, New Providence, Bahamas ; U. S. Fish Comm., 1886 (14533).
 Florida :

- Cape Florida ; E. Palmer, 1884 (8761).
 Indian Key ; E. Palmer, 1884 (8732, 8763) ; H. Hemphill, 1885 (12934).
 Big Pine Key ; H. Hemphill, 1885 (12922).
 Key West ; E. Palmer, 1884 (7497).
 Dry Tortugas ; L. Agassiz (2485) ; E. Palmer, 1884 (8762).
 Gulf of Mexico ; U. S. Fish Comm., 1885 :
 Off Havana, Cuba, 169 fath., Cr. ; sta. 2333 (10667).
 Lat. $28^{\circ} 45'$ N., long. $85^{\circ} 02'$ W., 30 fath., Cr. ; sta. 2405 (10666).
 Off Cape Catoche, Yucatan, 21 fath., Cr. ; sta. 2363 (10059).

23. *Diadema setosum* Gray—Continued.

West Indies; U. S. Fish Comm., 1884:

St. Thomas (7493, 7494, 7495, 8431).

Off Jamaica; lat. $17^{\circ} 52' N.$, long. $76^{\circ} 45' 30'' W.$, 215 fath., M.; sta. 2139 (8429).

Caribbean Sea; U. S. Fish Comm., 1884:

Old Providence Island (7492, 7496).

Curaçao Island (8430).

Lat. $17^{\circ} 44' 05'' N.$, long. $75^{\circ} 39' W.$, 23 fath., Cr. Sh.; sta. 2138 (8433).

Madeira; Wm. Stimpson, N. Pac. Expl. Exped. (3529).

Hilo, Sandwich Islands; Wm. Stimpson, N. Pac. Expl. Exped., 1856 (3495).

Hong Kong, China; Wm. Stimpson, N. Pac. Expl. Exped., 1854 (3545, 3557).

Unknown localities (2402, 3466, 3515, 3519).

ASPIDODIADEMA A. Agassiz.**24. *Aspidodiadema antillarum* A. Agassiz.**

Mouth of Exuma Sound, Bahama Islands; lat. $23^{\circ} 48' 40'' N.$, long. $75^{\circ} 10' 40'' W.$, 1,169 fath., Cr. S.; U. S. Fish Comm., sta. 2629, 1886 (14548).

Gulf of Mexico; lat. $28^{\circ} 38' 30''$ to $28^{\circ} 51' N.$, long. $87^{\circ} 02'$ to $88^{\circ} 18' W.$, 420–730 fath., M.; U. S. Fish Comm., sta. 2385, 2392, 2393, 2394, 1885 (10663, 14547).

Gulf of Mexico; lat. $24^{\circ} 36' N.$, long. $84^{\circ} 05' W.$, 955 fath.; U. S. Coast Survey str. Blake, A. Agassiz, 1877–78 (6796).

Southeast of Cuba; lat. $19^{\circ} 45' N.$, long. $75^{\circ} 04' W.$, 1,639 fath., M.; U. S. Fish Comm., sta. 2127, 1884 (8396).

25. *Aspidodiadema Jacobyi* A. Agassiz.

North of Little Bahama Bank; lat. $27^{\circ} 22' N.$, long. $78^{\circ} 07' 30'' W.$, 338 fath., gy. S.; U. S. Fish. Comm., sta. 2655, 1886 (14550).

Off Havana, Cuba; U. S. Fish Comm.:

Sta. 2164, 192 fath., 1884 (8393).

Sta. 2346, 2347, 2350, 200–216 fath., 1885 (10664).

Off Havana, 1886 (14549).

Southeast of Cuba; U. S. Fish Comm., 1884:

Lat. $19^{\circ} 56' 44'' N.$, long. $75^{\circ} 50' 49'' W.$, 202 fath., Cr. S.; sta. 2131 (8392).

Lat. $19^{\circ} 56' 06'' N.$, long. $75^{\circ} 47' 32'' W.$, 254 fath.; sta. 2134 (8394).

Off Cayman Brac, south of Cuba, 297 fath.; U. S. Coast Survey str. Blake, A. Agassiz, 1880 (6802).

Off Cozumel Island, Yucatan; lat. $20^{\circ} 19' 10'' N.$, long. $87^{\circ} 03' 30'' W.$, 231 fath., Cr.; U. S. Fish Comm., sta. 2359, 1885 (10665).

Darien Bay; lat. $9^{\circ} 30' 45'' N.$, long. $76^{\circ} 25' 30'' W.$, 155 fath., M.; U. S. Fish Comm., sta. 2143, 1884 (8395).

ECHINOTHRIX Peters.**26. *Echinothrix calamaris* A. Agassiz.**

Port Lloyd, Bonin Islands; W. J. Fisher (14034).

Tahiti, Society Islands; Dr. W. H. Jones, U. S. N., 1883 (7499).

Unknown locality (3536).

27. *Echinothrix turcarum* Peters.

Port Lloyd, Bonin Islands; Wm. Stimpson, N. Pac. Expl. Exped., 1854 (3547).

Hilo, Sandwich Islands; Wm. Stimpson, N. Pacific Expl. Exped., 1856 (3419).

Tahiti, Society Islands, and Marquesas Islands; Dr. W. H. Jones, U. S. N., 1883 (7498, 8824).

Unknown locality (3532).

ASTROPYGA Gray.

28. *Astropyga pulvinata* Agassiz.

Central America:

San Salvador (3062).

West Coast; Capt. J. M. Dow (3491).

Family ECHINOTHURIDÆ Wyv. Thomson.

ASTHENOSOMA Grube.

29. *Asthenosoma hystrix* A. Agassiz.

Atlantic Ocean, off Cape Romain, S. C.; U. S. Fish Comm., 1885:

Lat. $32^{\circ} 36' N.$, long. $77^{\circ} 29' 15'' W.$, 258 fath., gy. S.; sta. 2624 (12941).Lat. $32^{\circ} 35' N.$, long. $77^{\circ} 30' W.$, 247 fath., gy. S.; sta. 2625 (12942).Atlantic Ocean, off Georgia; lat. $30^{\circ} 44' N.$, long. $79^{\circ} 26' W.$, 440 fath., S. Sh. Cr.; U. S. Fish. Comm., sta. 2415, 1885 (10674).Off the east coast of Florida; lat. $28^{\circ} 21' N.$ to lat. $31^{\circ} 09' N.$, long. $78^{\circ} 33' W.$ to long. $80^{\circ} 05' 45'' W.$, 263 to 514 fath., S. F. Cr.; U. S. Fish Comm., sta. 2658-2669 (14600, 14736-14741).

Off Havana, Cuba, 213 fath., Cr.; U. S. Fish Comm., sta. 2350, 1885 (10673).

Off Cozumel Island, Yucatan; lat. $20^{\circ} 19' N.$, long. $87^{\circ} 03' 30'' W.$, 222 fath., Cr.; U. S. Fish Comm., sta. 2358, 1885 (10668).

Off Barbados, Windward Islands; U. S. Coast Survey str. Blake, A. Agassiz, 1878-79:

Sta. 274, 209 fath. (6823).

Sta. 291, 200 fath. (6829).

Sta. 297, 123 fath. (6821).

PHORMOSOMA Wyv. Thomson.

30. *Phormosoma placenta* Wyv. Thomson.Off Nova Scotia, between Halifax and Le Have Bank; lat. $43^{\circ} 34' N.$, long. $63^{\circ} 56' 30'' W.$, 134 fath., gy. O.; U. S. Fish Comm., sta. 2513, 1885 (11712).Atlantic Ocean, East and South of George's Bank; lat. $41^{\circ} 53' N.$ to lat. $40^{\circ} 09' 30'' N.$, long. $65^{\circ} 21' 50'' W.$ to long. $67^{\circ} 26' 15'' W.$; 499-1,356 fath., M. S. O.; U. S. Fish Comm., sta. 2072 (8671), 2074 (9050), 2075 (9046), 2077 (9051), 2078 (8673), 2083 (8650), 2530 (11707), 2533 (11711), 2571 (11713).Atlantic Ocean, off George's Bank; lat. $41^{\circ} 33' 15'' N.$, long. $65^{\circ} 51' 25'' W.$, 810 fath.; U. S. Coast Survey str. Blake, A. Agassiz, sta. 305, 1880 (6817).Atlantic Ocean, off the Coast of Southern New England; lat. $39^{\circ} 47' 20'' N.$ to lat. $39^{\circ} 33' N.$, long. $69^{\circ} 21' 25'' W.$ to long. $71^{\circ} 31' 30'' W.$; 924 to 1,178 fath., M. S. O. F.; U. S. Fish Comm., sta. 2052 (9048), 2094 (6206, 8672), 2205 (7811), 2208 (7813), 2209 (7814), 2210 (7936), 2217 (7816), 2220 (7817).Atlantic Ocean, east of Delaware and North Carolina; lat. $38^{\circ} 47' 20'' N.$ to lat. $35^{\circ} 45' 23'' N.$; 843-1,091 fath., M. fine. S. O.; U. S. Fish Comm., sta. 2103 (6648), 2115 (6636), 2116 (6641), 2231 (8101).Off Cape Fear, N. C.; lat. $32^{\circ} 40' N.$, long. $76^{\circ} 40' 30'' W.$, 731 fath., gy. O.; U. S. Fish Comm., sta. 2678, 1886 (14596).Off Saint Augustine, Fla.; lat. $29^{\circ} 41' N.$, long. $79^{\circ} 55' W.$, 373 fath., Cr. S.; U. S. Fish Comm., sta. 2664, 1886 (14599).North of Little Bahama Bank; lat. $27^{\circ} 57' 30'' N.$, long. $77^{\circ} 27' 30'' W.$, 660 fath., yl. O.; U. S. Fish Comm., sta. 2654 (14595).

30. Phormosoma placenta Wyv. Thompson—Continued.

Gulf of Mexico; U. S. Fish Comm., 1885:

Lat. $28^{\circ} 36' 15''$ N., long. $86^{\circ} 50'$ W., 347 fath., M.; sta. 2395 (10672).

Lat. $28^{\circ} 32'$ N., long. $88^{\circ} 06'$ W., 1,181 fath., M.; sta. 2383 (10671).

Lat. $29^{\circ} 03' 15''$ N., long. $88^{\circ} 16'$ W., 324 fath., M.; sta. 2376 (10670).

Caribbean Sea, U. S. Fish Comm., 1884:

Lat. $15^{\circ} 24' 40''$ N., long. $63^{\circ} 31' 30''$ W., 683 fath., M. fine. S.; sta. 2117 (8424).

Lat. $9^{\circ} 30' 45''$ N., long. $76^{\circ} 25' 30''$ W., 155 fath., M.; sta. 2143 (8425).

Off the Windward Islands; U. S. Coast Survey str. Blake, A. Agassiz, 1878-'79:

Off St. Kitts, 250 fath.; sta. 147 (6811).

Off Montserrat, 303 fath.; sta. 153 (6814).

Off Grenada, 291 fath.; sta. 260 (6806).

31. Phormosoma uranus Wyv. Thomson.

Atlantic Ocean, off the eastern coast of the United States; U. S. Fish Comm., 1883-1886:—

Southeast of George's Bank:

Lat. $40^{\circ} 34' 30''$ N., long. $66^{\circ} 48'$ W., 705 fath., gy. M.; sta. 2532 (11400).

Lat. $40^{\circ} 34' 18''$ N., long. $66^{\circ} 09'$ W., 1,742 fath., gy. M. S.; sta. 2573 (11810).

Lat. $40^{\circ} 16' 30''$ N., long. $67^{\circ} 26' 15''$ W., 828 fath., bn. O.; sta. 2533 (11302).

South of Martha's Vineyard:

Lat. $39^{\circ} 47' 07''$ N., long. $70^{\circ} 35'$ W., 721 fath., gy. O.; sta. 2552 (11310).

South of Block Island:

Lat. $39^{\circ} 35'$ N., long. $71^{\circ} 18'$ W., 1,064 fath., gy. O.; sta. 2211 (10854).

Lat. $39^{\circ} 34' 45''$ N., long. $71^{\circ} 31' 30''$ W., 1,080 fath., M. S.; sta. 2209 (7824).

Lat. $39^{\circ} 34' 15''$ N., long. $71^{\circ} 41' 15''$ W., 705 fath., M. S.; sta. 2203 (8128).

Lat. $39^{\circ} 30' 30''$ N., long. $71^{\circ} 44' 30''$ W., 728 fath., M.; sta. 2204 (8127).

Lat. $39^{\circ} 29'$ N., long. $71^{\circ} 46'$ W., 693 fath., gy. M. fine. S.; sta. 2181 (8131).

South of Long Island:

Lat. $39^{\circ} 12'$ N., long. $72^{\circ} 03' 30''$ W., 707 fath., gn. M.; sta. 2235 (8093).

Lat. $39^{\circ} 09'$ N., long. $72^{\circ} 03' 15''$ W., 810 fath., gn. M.; sta. 2234 (8092).

East of Maryland:

Lat. $38^{\circ} 01' 15''$ N., long. $73^{\circ} 44'$ W., 568 fath., gn. M.; sta. 2172 (8130).

East of North Carolina:

Lat. $35^{\circ} 49' 30''$ N., long. $74^{\circ} 34' 35''$ W., 843 fath., M. fine. S.; sta. 2115 (8674, 10853).

Lat. $35^{\circ} 45' 23''$ N., long. $74^{\circ} 31' 25''$ W., 888 fath., M. fine. S.; sta. 2116 (10855).

Lat. $32^{\circ} 40'$ N., long. $76^{\circ} 40' 30''$ W., 731 fath., gy. O.; sta. 2678 (14597).

Off Grenada, Windward Islands, 1,058 fath.; U. S. Coast Survey str. Blake, A. Agassiz, sta. 245, 1878-'79 (6819).

Family **ECHINOMETRADÆ** Gray.**COLOBOCENTROTUS** Brandt.**32. Colobocentrotus atratus** Brandt.

Sandwich Islands:

Garrett, Mus. Comp. Zool. (3442).

Hilo; Wm. Stimpson, N. Pacific Expl. Exped. (3494).

Unknown localities (2569, 2572, 2664, 2992).

33. Colobocentrotus Mertensii Brandt.

Bonin Islands:

Wm. Stimpson, N. Pacific Expl. Exped. (2490).

Port Lloyd; Wm. Stimpson, N. Pacific Expl. Exped. (3437); W. J. Fisher, (14039).

HETEROCENTROTUS Brandt.

34. *Heterocentrotus mammillatus* Brandt.

Sandwich Islands:

Garrett, Mus. Comp. Zool. (3527).

Hilo; Wm. Stimpson, N. Pacific Expl. Exped. (3573).

Palmyra Island; Dr. W. H. Jones, U. S. N. (8654).

Johnson's Island (5949).

Feejee Islands; U. S. Expl. Exped. (3572).

Loo Choo Islands; Wm. Stimpson, N. Pacific Expl. Exped. (3463).

Bonin Islands:

Wm. Stimpson, N. Pacific Expl. Exped. (2486); W. J. Fisher (14033).

Port Lloyd; Wm. Stimpson, N. Pacific Expl. Exped. (3526, 3552).

Manila ? (3464).

35. *Heterocentrotus trigonarius* Brandt.

Palmyra Island; Dr. W. H. Jones, U. S. N. (8733).

Kingsmill Islands; Garrett, Mus. Comp. Zool. (3443).

Panmotu Islands ? (3564).

Tahiti, Society Islands; Dr. W. H. Jones, U. S. N., 1883 (8758).

Friendly Islands; U. S. Expl. Exped. (2593).

Feejee Islands or Tongatabu; U. S. Expl. Exped. (3612).

South Pacific Ocean; Capt. Wm. Herrendean, 1876 (14031).

Unknown localities (2576, 2577, 3461, 3535, 3634, 3646, 4018).

ECHINOMETRA Rondelet.

36. *Echinometra lucunter* Blainville.

Japan:

Hakodadi; U. S. S. Tuscarora (3248, 3249).

Ousima; Wm. Stimpson, N. Pacific Expl. Exped. (2504, 3456, 3457).

Loo Choo Islands; Wm. Stimpson, N. Pacific Expl. Exped. (3583, 3613).

Bonin Islands; Wm. Stimpson, N. Pacific Expl. Exped. (3591, 3617).

Sooloo Sea (3603).

Sandwich Islands:

Wm. Stimpson, N. Pacific Expl. Exped. (3548).

Oahu; Dr. T. H. Streets, U. S. N. (5942).

Palmyra Island; Dr. W. H. Jones, U. S. N. (8651).

Panmotu Islands; U. S. Expl. Exped. (3587).

Society Islands:

Mus. Comp. Zool. (3533).

Tahiti; Wm. Stimpson, N. Pacific Expl. Exped. (3575); Dr. W. H. Jones,

U. S. N., 1884 (7231, 7379).

Apia, Samoan Islands; Dr. W. H. Jones, U. S. N., 1883 (8754).

Zanzibar, Africa; Mus. Comp. Zool. (3580).

37. *Echinometra oblonga* Blainville.

Sandwich Islands; Garrett (3559).

Rose Island, Pacific Ocean; U. S. Expl. Exped. (3582).

Unknown locality (3065).

38. *Echinometra subangularis* Desml.

Bermuda; Dr. F. V. Hamlin (5102).

Bahamas, U. S. Fish Comm., 1886: Abaco (14529), Nassau (14530), Cat Island (14532), Watling's Island (14531), Rum Cay (14540).

38. Echinometra subangularis Desm. — Continued.

Florida:

(2435, 3090, 3429); Wurdemann (2431, 2432, 2433).

Cape Florida; E. Palmer, 1884 (8759).

Indian Key; H. Hemphill, 1885 (14307).

Big Pine Key; H. Hemphill, 1885 (12921).

Key West; U. S. Fish Comm., 1884 (7226); H. Hemphill, 1884 (8753, 8795); reefs, low tide, H. Hemphill, 1885 (10047); among stones, low tide, H. Hemphill, 1885 (10048).

West Indies (3247):

Nassau, New Providence; W. Whetten, 1859 (8755).

San Domingo; Wm. Gabb, 1878 (5158, 5172).

St. Thomas; U. S. Fish Comm., 1884 (7227, 7374).

Tortola, Virgin Islands (3469).

Caribbean Sea:

Curaçao Island; U. S. Fish Comm., 1884 (7376).

Sabanilla, U. S. of Colombia; U. S. Fish Comm., 1884 (7230, 7377).

Old Providence Island; U. S. Fish Comm., 1884 (7228, 7375).

Aspinwall; T. R. Gilliss (3455).

Vera Cruz, Mexico; Mexican Geogr. Comm. (12575).

Brazil:

U. S. Expl. Exped. (3563).

Pernambuco; C. F. Hartt, 1875 (6993).

39. Echinometra Van Brunti A. Agassiz.

Lower California:

La Paz; L. Belding (5390); A. Forrer (10012, 10015).

Cape St. Lucas; John Xantus (2463, 2465, 2467, 3050, 3052, 3241, 3610).

Mexico:

West Coast: Prof. A. Dugès (4306, 12579); Lient. Comdr. H. E. Nichols, U. S. N., 1881 (6743).

Mazatlan (3079); Mexican Geogr. Comm. (12527).

Manzanillo; John Xantus (3487).

Acapulco; Mus. Comp. Zool. (3565).

San Salvador; Capt. J. M. Dow (6994).

Panama; Mus. Comp. Zool. (3562).

Manta, Ecuador; Dr. W. H. Jones, U. S. N., 1884 (8704).

Chatham Island, Galapagos Islands; Dr. W. H. Jones, U. S. N., 1884 (8734, 8749).

40. Echinometra viridis A. Agassiz.

Florida:

Key West; H. Hemphill, 1884 (8703).

Key Biscayne; Mus. Comp. Zool. (3570).

West Indies; U. S. Fish Comm., 1884 (var. *plana*):

Jamaica (7225, 7378).

St. Thomas (7229).

Unknown localities (2353); var. *plana* (3620).

PARASALENIA A. Agassiz.

41. Parasalenia gratiosa A. Agassiz.

Port Lloyd, Bonin Islands, among corals in one fathom; Wm. Stimpson, North Pacific Expl. Exped., 1854; type (3125).

China (?); Dale and Jouy, U. S. S. Palos.

STOMOPNEUSTES Agassiz.

42. *Stomopneustes variolaris* Agassiz.

Mauritius Islands, Indian Ocean; Mus. Comp. Zool. (3417).

Unknown locality (3460).

STRONGYLOCENTROTUS Brandt.

43. *Strongylocentrotus albus* A. Agassiz.

Valparaiso, Chili; Dr. W. H. Jones, U. S. N., 1883 (8735).

44. *Strongylocentrotus depressus* A. Agassiz.

Simoda, Japan; Wm. Stimpson, North Pacific Expl. Exped. (3602).

45. *Strongylocentrotus Dröbachiensis* A. Agassiz.*European Coasts.*

Spitzbergen:

Spitzbergen Sea; U. S. S. Alliance, 1881 (5903).

Bjornen's Bay, 7-10 fath.; U. S. S. Alliance, 1881 (5223).

South Gatt, 7 fath.; Ensign E. Wilkinson, U. S. N. (8635).

Norway:

Kors Fjord; Rev. A. M. Norman, 1884 (8624).

Bergen; Bergen's Museum, 1884 (8575).

Kielerbucht, Germany; C. Möbius (3850).

England; J. Alder (3441).

Eastern North America.

Greenland (3599):

West coast of Greenland; Ensign H. G. Dresel, U. S. N., 1883 (8701).

Upernavik; Ensign H. G. Dresel, U. S. N., 1883 (8699, 8700).

Godthaab; L. Knudsen (7133).

Cumberland Gulf: Niantulik Harbor; Lieut. W. A. Mintzer, U. S. N., 1876 (3239).

Hudson's Bay:

South end; C. Drexler (3420).

James Bay; C. Drexler (3421).

Labrador: L'anse au Loup, 15 fath.; Allen and Barrows, 1882 (3933).

Newfoundland; Theodore Gill (3566).

Grand Bank of Newfoundland, 40-50 fath.; Gloucester sch. Gussie Blaisdell (4796); Gloucester sch. Victor (4793).

Banquereau, 50 fath.; Gloucester sch. Mystic (4899).

Nova Scotia; J. R. Willis (2418).

New Brunswick: Grand Manan; Wm. Stimpson (3438).

Maine:

Eastport; A. E. Verrill (4102).

Castine; Crittenden (3240).

Massachusetts Bay; Wm. Stimpson (2420, 2421).

Saybrook, Conn. (2422).

New Jersey (3064); Gedney (2334).

Off the Atlantic coast of the British Provinces of North America; U. S. Fish Comm.:

Off SE. edge of the Grand Bank of Newfoundland, 129-179 fath., S. G. (2 stations).

SE. corner of the Grand Bank, 33-64 fath., S. (3 stations).

NE. part of the Grand Bank, 36-44 fath., S. brk. Sh. (6 stations).

Off SE. coast of Newfoundland, 86 fath., G.; sta. 2456 (11047).

45. *Strongylocentrotus Dröbachiensis* A. Agassiz—Continued.

Off the Atlantic Coast of the British Provinces, &c.—Continued.

Saint John's, Newfoundland (11078).

Green Bank, 45 fath., brk. Sh. ; sta. 2463 (11057).

S. end Bank of Saint Pierre, 42-67 fath., fine. bk. S. (2 stations).

Between Bank of Saint Pierre and Banquereau, 190-204 fath., fine. crs. S. G. (2 stations).

Off E. edge Banquereau, 129-219 fath., S. G. brk. Sh. (5 stations).

E. edge Banquereau, 39 fath., gy. S. G. ; sta. 2487 (11061).

Misaine Bank, 44-75 fath., S. P. brk. Sh. hrd. (6 stations).

Le Have Bank, 55-62 fath., rocky, stony, S. (3 stations).

SW. of Le Have Bank, 104 fath., S. G. ; sta. 2522 (11079).

Between Middle Ground and Halifax, N. S., 43 fath., crs. S. ; sta. 2509 (11087).

Off Nova Scotia, 47-190 fath., S. G. P. R. (9 stations).

Halifax Harbor and Bedford Basin, 16-41 fath., M. S. O. (11 stations).

Eastern coast of the United States ; U. S. Fish Comm. :

Bay of Fundy, 1872 (13395).

Eastport, Me., 1872 (5067, 5084).

Gulf of Maine, 1878 (5068).

Off Cape Ann, Mass., 47-90 fath., M. (13148, 13413).

Gloucester Harbor, Mass. (13412).

Massachusetts Bay, 16-22 fath., S. G. (13146, 13587).

Cape Cod Bay, 7-31 fath., S. M. (many stations).

Off Cape Cod, 10-106 fath., S. G. St. M. (many stations).

Georges Bank region, 17-131 fath., S. G. M. (23 stations).

Off Nantucket Shoals, 18-33 fath., S. (4 stations).

Off Martha's Vineyard, Mass., 67 fath., M. S. (10043).

Vineyard Sound, Mass. (5 stations).

Off Newport, R. I. (6 stations).

Off Noank, Conn. (3699, 7134, 13703).

Patchogue, Long Island (8542).

Western North America.

Alaska :

Cape Smyth ; Pt. Barrow Ex., 1882 (8618).

Lat. $71^{\circ} 02' N.$, long. $157^{\circ} 46' W.$, 19 fath. ; U. S. S. Corwin, 1884 (10880).Off Pt. Franklin, $13\frac{1}{2}$ fath. ; Pt. Barrow Ex., 1883 (8684).

Off Hotham Inlet, 4 fath. ; U. S. S. Corwin, 1884 (10881).

Off Pt. Hope, 25 fath. ; U. S. S. Corwin, 1884 (10882).

Lat. $66^{\circ} 12' N.$, long. $168^{\circ} 54' W.$, 30 fath., Sh. P. ; Lieut. G. M. Stoney, U. S. N., 1884 (10886).Off Port Clarence, $7\frac{1}{2}$ fath. ; Pt. Barrow Ex., 1883 (8669).Lat. $65^{\circ} 55' 15'' N.$, long. $168^{\circ} 09' 30'' W.$, 30 fath. ; U. S. S. Corwin, 1884 (10884).Lat. $65^{\circ} (25' \text{ to } 28') N.$, long. $171^{\circ} (11' \text{ to } 26') W.$, $6\frac{1}{4}$ -11 fath. ; U. S. S. Corwin, 1885 (12858).

Norton Sound ; E. W. Nelson, 1879-'80 (5937) ; Pt. Barrow Ex., 1883 (8668).

Saint Paul Island ; H. W. Elliott, 1874 (8812).

Saint Michaels ; L. M. Turner, 1875 (5934, 14038).

Mouth of Yukon River, $3\frac{1}{2}$ fath. ; E. W. Nelson, 1877 (5243).

Kodiak ; W. G. W. Harford (3230) ; W. J. Fisher (4245).

Near Sitka ; Comdr. L. A. Beardslee, U. S. N. (6879).

Security Bay ; Dr. W. H. Jones, U. S. N., 1883 (8633).

Wrangell ; Dr. W. H. Jones, U. S. N., 1882 (8627, 8779).

Ward Cove. Revilla Regida Island ; Dr. T. H. Streets, U. S. N. (14030).

Southern Alaska ; Dr. W. H. Jones, U. S. N., 1883 (7126, 8631, 8778).

45. *Strongylocentrotus Dröbachiensis* A. Agassiz—Continued.

Alaska; W. H. Dall, 1865-1880:

Bering Sea (12332).

Kyska Harbor, 9-12 fath. (8625).

Captain's Harbor, Unalashka, 9-80 fath., S. G. (4 stations).

Ilulink Harbor, Unalashka (7032, 8623, 8737).

Unalashka (7020).

Belkofiska Bay, 15-25 fath. (8634).

Coal Harbor, Unga (8622).

Popoff Straits, 6 fath. (8780).

Big Koninsha Island, Shumagins, 6-20 fath., S. R. (14040).

Chiachi Islands, 20 fath., M. (8708, 14047).

Semidi Islands, 15-25 fath. (8619).

Kodiak, 16-25 fath. (7027).

Saint Paul, Kodiak, 13 fath., M. (12341).

Chugachik Bay, Cook's Inlet, 20-60 fath. (7033, 8629).

Middleton Island, 10-12 fath. (8621).

British Columbia:

Parry Passage; J. G. Swan, 1883 (7132, 8636).

Kiovetta Village, Parry Passage; J. G. Swan, 1883 (12333).

Menzies Bay, Discovery Passage, 6 fath.; Lieut. Comdr. H. E. Nichols, U. S. N., 1881 (5939).

Departure and Alert Bays; Dr. W. H. Jones, U. S. N., 1882 (7030).

Gulf of Georgia; Mus. Comp. Zool. (2423).

Straits of Fuca (3568).

Washington Territory: Neah Bay; J. G. Swan (5935).

Siberia.

Siberian Coast:

"Arctic" (3431).

Bering Strait (3601).

Seniavine Strait; N. Pacific Expl. Exped. (3595).

Port Providence, Plover Bay; W. H. Dall, 1880 (8630).

Avatcha Bay, Kamtchatka; Wm. Stimpson, N. Pacific Expl. Exped. (2501).

Bering Island; L. Stejneger, 1882-'83 (8782).

Gulf of Penjinsk, Okhotsk Sea; N. Pacific Expl. Exped. (3510, 3511).

Okhotsk Sea; N. Pacific Expl. Exped. (3512).

See notes under *Strongylocentrotus purpuratus*, respecting the occurrence of this species in Puget Sound and the Straits of Fuca.

46. *Strongylocentrotus eurythrogrammus* A. Agassiz.

Port Jackson, Australia; Wm. Stimpson, North Pacific Expl. Exped. (3040, 3520).

47. *Strongylocentrotus franciscanus* A. Agassiz.

Alaska:

Granite Cove, Port Althorp; W. H. Dall (8816).

Saint Paul, Kodiak Island; W. J. Fisher.

Sitka; Bischoff (4028).

Puget Sound (2481).

48. *Strongylocentrotus gibbosus* A. Agassiz.

Peru:

C. H. Raymond (3605).

Pacasmayo; Dr. W. H. Jones, U. S. N., with *Fabia chilensis* Dana (8709).

Unknown locality (3256).

49. *Strongylocentrotus globulosus* A. Agassiz.

Hakodadi, Japan; W. J. Fisher, U. S. S. Tuscarora (3618).

Keelung Harbor, Formosa, China; William Stimpson, N. Pac. Expl. Exped. (2493).

The specimen above recorded from Formosa was described by Mr. A. Agassiz in 1863* as *Toxocidaris globulosa*, a species which he afterwards † united with *Strongylocentrotus franciscanus*, of the west coast of North America. Mr. Agassiz apparently had only large specimens of the *franciscanus*, which often bear a close resemblance to the specimens of *globulosus*, the largest of which, however, measures only about $2\frac{2}{5}$ inches in diameter. In the collection of the National Museum there are now several specimens of *S. franciscanus* of small to medium size, which permit of a more exact comparison being made, and indicate that considerable differences exist between these two species. In the *franciscanus* the coronal plates are broader and fewer in number, the primary tubercles much larger with a much wider scrobicular circle, and the poriferous zone narrower. In two specimens measuring about $1\frac{1}{2}$ inches in diameter there are 12 coronal plates in the interambulaeal area of *franciscanus*, and 17 in that of *globulosus*. Unfortunately neither the actinal nor abactinal systems are present in any of the specimens of *globulosus*, but the differences exhibited by the remainder of the test are sufficient to show that the species are probably distinct.

50. *Strongylocentrotus intermedius* A. Agassiz.

Hakodadi Bay, Japan; Wm. Stimpson, North Pacific Expl. Exped. (3432).

51. *Strongylocentrotus lividus* Brandt.

England; J. Alder (2397).

Ireland: Roundstone, County Galway; W. W. Walpole (8725); A. M. Norman, 1884 (7019).

France:

Baie de Douarnenez, Finistère; F. Cailliaud (8614).

Nice; Bourkhardt (3524).

52. *Strongylocentrotus mexicanus* A. Agassiz.

Cape Saint Lucas, Lower California; J. Xantus (2637).

53. *Strongylocentrotus nudus* A. Agassiz. (?)

Locality unknown, probably Japan or the Sandwich Islands (3594).

This single specimen was originally labeled by Mr. A. Agassiz "*Toxocidaris nuda??*", and it agrees tolerably well with his description of that species, although it bears some resemblance, both as regards its general appearance and a few details, to certain specimens of *S. franciscanus* in the Museum collection from Sitka, Alaska. The arcs of pores are, however, straighter, and contain only from five to six pairs of pores each; the actinostome is also proportionally larger. The label of locality is missing, but the specimen probably belonged to the collection of the North Pacific Exploring Expedition.

* Proc. Acad. Nat. Sci. Phila. 1863, p. 356.

† Revision of the Echini, 1873, p. 442.

54. Strongylocentrotus purpuratus A. Agassiz.

Alaska: Sitka; Bischoff (8810).

British Columbia: Kioosta Village, Parry Passage; James G. Swan, 1883 (8814).

Washington Territory:

Straits of Fuca; D. S. Jordan, 1880 (3775).

Puget Sound; D. S. Jordan, 1880 (3760).

California:

William Stimpson (2495). One of Stimpson's types of the species.

San Francisco; H. Hemphill (3231).

Farallone Islands; Charles H. Townsend, 1884 (8811).

Santa Cruz; A. Forrer, 1885 (10014).

Monterey; D. S. Jordan, 1880 (3766); W. H. Dall (3337).

San Miguel Island; W. H. Dall (8808).

Santa Cruz Island; H. Henshaw (3251).

Catalina Harbor, Santa Catalina Island; W. H. Dall (8813).

San Diego; W. J. Fisher (3236).

La Paz, Lower California; L. Belding, 1882 (8815).

Unknown localities (3590, 8809).

Number 2495 is one of Stimpson's original types, described in 1857, and probably came from San Francisco. The single specimen from Sitka, Alaska (8810), agrees quite closely with specimens from San Francisco and other parts of California, and was received about ten years ago, in connection with numerous specimens of *S. franciscanus* from the same place. As *S. purpuratus* had not been recorded previously from north of Puget Sound, I was inclined to believe that this specimen had been accidentally mixed in with the others, and in reality belonged to some more southern locality. The receipt since then of a specimen from Parry Passage, British Columbia (8814), which apparently represents the same species, makes the extended northern range of *S. purpuratus* seem more probable.

The specimens above recorded from the Straits of Fuca (3775) and Puget Sound (3760) exhibit a considerable range of variation in the direction of *S. Dröbachiensis*, which also occurs at the same place, making it very difficult, and, in fact, impossible, to always separate the two species with certainty. The variation is manifested both in the test and spines, the former differing much in shape, and in the size and arrangement of the tubercles; the specimens are mostly small. Quite typical specimens of *S. purpuratus* are not uncommon, with the characteristic stout spines, often purplish, as farther south, but frequently greenish. Specimens from Departure and Alert Bays, recorded under *S. Dröbachiensis*, present some of the same modifications; but in the small collection from that place I have found nothing that could be safely referred to *S. purpuratus*.

55. Strongylocentrotus tuberculatus Brandt.

Japan:

W. J. Fisher, U. S. S. Tuscarora (6381).

North end of Nippon; Wm. Stimpson, N. Pacific Expl. Exped. (3593).

Hong Kong Harbor, China; Wm. Stimpson, N. Pacific Expl. Exped. (3043, 3136, 3235).

SPHÆRECHINUS Desor.

56. *Sphærechinus granularis* A. Agassiz.

Fayal, Azores; Dabney (3538).

Funchal Bay, Madeira; Wm. Stimpson, N. Pacific Expl. Exped. (1773, 2500).
Nice, France; Mus. Comp. Zool. (3544).

57. *Sphærechinus pulcherrimus* A. Agassiz.

Japan:

W. J. Fisher, U. S. S. Tuscarora (3608).

N. E. shore of Nippon; Brook and Kern, N. Pacific Expl. Exped. (3449).

China (?); Dale and Jony, U. S. S. Palos (8656).

Unknown locality (3446).

PSEUDOBOLETIA Troschel.

58. *Pseudoboletia indiana* A. Agassiz.

Unknown locality; U. S. Expl. Exped., 1839 (2591).

Family ECHINIDÆ Agassiz.

Subfamily TEMNOPLEURIDÆ Desor.

TEMNOPLEURUS Agassiz.

59. *Temnopleurus Hardwickii* A. Agassiz.

Japan:

Hakodadi; W. J. Fisher, U. S. S. Tuscarora (3250).

East coast of Nippon; Wm. Stimpson, N. Pacific Expl. Exped. (3592).

Kagosima; Wm. Stimpson, N. Pacific Expl. Exped. (3470).

Unknown locality (8692).

60. *Temnopleurus Reynaudi* Agassiz.

China (?); Dale and Jouy, U. S. S. Palos (8767, 8768).

Unknown localities (3600, 8774).

61. *Temnopleurus toreumaticus* Agassiz.

East India; Mus. Comp. Zoology (3459).

China (?); Dale and Jony, U. S. S. Palos (8766, 8769).

Unknown locality (3447).

TEMNECHINUS Forbes.

62. *Temnechinus maculatus* A. Agassiz.

Atlantic Ocean, off Cape Hatteras, N. C., 43-49 fath., S.; U. S. Fish Comm., sta. 2307 (12953), sta. 2596 (12954).

Straits of Florida; lat. 25° 04' 50" N., long. 80° 15' 10" W., 56 fath., Cr. S.; U. S. Fish Comm., sta. 2639, 1886 (14546).

Gulf of Mexico; U. S. Fish Comm., 1885:

Lat. 29° 18' 15" N., long. 85° 32' W., 25 fath., ers. S. brk. Sh.; sta. 2370 (10689).

Lat. 29° 15' 30" N., long. 85° 29' 30" W., 27 fath., G.; sta. 2372 (10690).

Lat. 28° 45' N., long. 85° 02' W., 30 fath., S. brk. Cr.; sta. 2405 (10691).

Windward Islands; U. S. Coast Survey str. Blake, A. Agassiz, 1878-'79;

Off Grenada, 170 fath. (6839).

Off Barbados, 96 fath. (6789).

MICROCYPHUS Agassiz.

63. *Microcypus maculatus* Agassiz.

Japan; Wm. Stimpson, N. Pac. Expl. Exped. (3134).

TRIGONOCIDARIS A. Agassiz.

64. *Trigonocidaris albida* A. Agassiz.

Off St. Vincent, West Indies, 88 fath.; U. S. Coast Survey str. Blake, A. Agassiz, 1873-'79 (6797).

Off Havana, Cuba; lat. $23^{\circ} 09' 15''$ N., long. $82^{\circ} 21' W.$, 177 fath.; U. S. Coast Survey str. Blake, A. Agassiz, 1877-'78 (6831).

Off Havana, Cuba, 98-216 fath.; U. S. Fish Comm., 1884-'85 (11 stations).

Off Cozumel Island, Yucatan; lat. $20^{\circ} 19' N.$, long. $87^{\circ} 03' 10'' W.$, 178 fath., Cr.; U. S. Fish Comm., sta. 2357, 1885 (10692).

SALMACIS Agassiz.

65. *Salmacis globator* Agassiz.

Sydney, Australia; Australian Museum (5936).

66. *Salmacis rarisipina* Agassiz.

Unknown locality; Mus. Comp. Zool. (3578).

MESPIILIA Desor.

67. *Mespilia globulus* Agassiz.

Onsima, Japan; Wm. Stimpson, N. Pac. Expl. Exped. (3621).

Unknown localities (2586, 2587, 3458, 3468, 3567).

Subfamily TRIPLECHINIDÆ A. Agassiz.

PHYMOSOMA Haimé.

68. *Phymosoma crenulare* A. Agassiz.

Hakodadi, Japan; Wm. Stimpson, N. Pacific Expl. Exped. (3137).

ECHINUS Rondelet.

69. *Echinus acutus* Lamarek.

Bergen, Norway; Bergen's Museum, 1884 (8573, 8613).

Milford Haven, Wales; Wm. Stimpson (8772).

70. *Echinus angulosus* A. Agassiz.

South Africa:

Cape of Good Hope; Wm. Stimpson, N. Pacific Expl. Exped. (3472).

Table Bay; I. Russell, U. S. Transit-of-Venus Exped., 1874-'75 (3648).

71. *Echinus elegans* Düb. & Kor. (?)

Atlantic Coast, United States, off Nantucket, Mass.; U. S. Fish Comm., 1884:

Lat. $39^{\circ} 47' 20'' N.$, long. $69^{\circ} 34' 15'' W.$, 924 fath., M.; sta. 2217 (7939).

Lat. $39^{\circ} 46' 22'' N.$, long. $69^{\circ} 29' W.$, 948 fath., M.; sta. 2218 (7940).

Off Cape Hatteras, N. C.; lat. $35^{\circ} 45' 23'' N.$, long. $74^{\circ} 31' 25'' W.$, 888 fath., M. fne. S.; sta. 2116, 1883 (8659).

72. *Echinus esculentus* Linné.

Bergen, Norway; Bergen's Museum (3108).

Oban, Scotland; Wm. Stimpson (3433).

Milford Haven, Wales; Wm. Stimpson (3542).

Finistère, France; Thomas Wilson (8771).

73. Echinus gracilis A. Agassiz.

Atlantic Coast, United States; U. S. Fish Comm.:

Off Martha's Vineyard, Mass., 1882, 89-134 fath., S. (5732, 5950, 9504, 13371).

Lat. $39^{\circ} 58'$ N., long. $69^{\circ} 42'$ W., 202 fath., S.; sta. 1092, 1882 (5654).Lat. $39^{\circ} 29'$ N., long. $72^{\circ} 19' 40''$ W., 74 fath., M. S.; sta. 2032, 1883 (6376).Lat. $38^{\circ} 39'$ N., long. $73^{\circ} 11'$ W., 130 fath., S.; sta. 1043, 1881 (5056, 8693).Lat. $32^{\circ} 35'$ N., long. $77^{\circ} 30'$ W. (off Cape Romain, S. C.), 247 fath., gy. S.; sta. 2625, 1885 (12953).**74. Echinus magellanicus** Philippi.

Ancon, Peru; George Keifer, 1884 (8819).

Port Gallant, Patagonia; Mus. Comp. Zool. (6808).

75. Echinus margaritaceus Lamarck.

Unknown localities (2589, 2590).

76. Echinus miliaris Müller.

Bergen, Norway; Bergen's Museum (3114, 8578).

England:

Salcombe, Devonshire; Rev. A. M. Norman, 1884 (7014).

Hastings; Rev. A. M. Norman, 1884 (7013).

Ireland; J. Alder (3503).

77. Echinus norvegicus Düben & Koren.

Hardangerfjord, Norway; Bergen's Museum, 1884 (8581).

Shetland Islands; Rev. A. M. Norman, 1884 (7012).

Kielerbücht, Germany; C. Möbius (3830).

Northeastern part of the Grand Bank; lat. $47^{\circ} 16'$ N., long. $51^{\circ} 16'$ W., 74 fath., fine. gy. S.; U. S. Fish Comm., sta. 2454, 1885 (11306).Southern edge of Middle Ground; lat. $44^{\circ} 19'$ N., long. $60^{\circ} 39' 15''$ W., 69 fath., fine. yl. S.; U. S. Fish Comm., sta. 2502, 1885 (11721).Atlantic Ocean, off George's Bank, and the southern coast of New England; lat. $41^{\circ} 09' 40''$ N. to lat. $39^{\circ} 26' 16''$ N., long. $66^{\circ} 02' 20''$ W. to long. $71^{\circ} 24' 30''$ W.; 948-1,742 fath., M. fine. S. F. O.; U. S. Fish. Comm., 1883-'85 (14 stations).Atlantic Ocean, south of Martha's Vineyard, Mass.; lat. $39^{\circ} 38' 20''$ N., long. $70^{\circ} 56'$ W., 1,241 fath.; U. S. Coast Survey str. Blake, A. Agassiz, 1880 (6809).Atlantic Ocean, east of Maryland, Virginia, and North Carolina; lat. $38^{\circ} 47' 20''$ N. to lat. $35^{\circ} 09' 50''$ N., long. $72^{\circ} 37'$ W. to long. $74^{\circ} 57' 40''$ W.; 888-1,497 fath., M. fine. S. O.; U. S. Fish. Comm., 1883-'84 (8 stations).

TOXOPNEUSTES Agassiz.

78. Toxopneustes maculatus A. Agassiz.

Christmas Island, Pacific Ocean; Dr. W. H. Jones, U. S. N. (8712).

Unknown localities (3632, 3633).

79. Toxopneustes pileolus Agassiz.

Ousima, Japan (2503).

Between Acapulco and Mazatlan, west coast of Mexico; Mexican Geogr. Comm. (12528).

Unknown locality (2408).

80. Toxopneustes semituberculatus Agassiz.

San Quentin Bay, Lower California; L. Belding (8817).

Chatham Island, Galapagos Islands, rocky beach; Dr. W. H. Jones, U. S. N., 1884 (8757).

Unknown locality (3604).

81. *Toxopneustes variegatus* A. Agassiz.

Bermuda; Mus. Comp. Zool. (3499).

Off Cape Lookout, N. C., 22 fath., S.; U. S. Fish Comm., 1885 (12874, 12876).

South Carolina (3579).

Florida (2405, 3088):

Southern Florida; H. Hemphill, 1884 (8679).

Key Vaccas; Hemphill, 1885 (14306).

Key West; D. S. Jordan, 1883 (8688); H. Hemphill, (8726, 10046); U. S. Fish Comm., 1884 (8410).

Eastern Dry Rocks, near Key West; E. Palmer, 1884 (8721).

Off Key West, 45-50 fath., Cr.; U. S. Fish Comm., sta. 2316-2318, 1885 (10681, 10685, 10687.)

Punta Rassa; H. Hemphill, 1884 (7517, 8687).

Charlotte Harbor; G. W. Mastin (2410, 2412).

Sarasota Bay; H. Hemphill, 1884 (8680).

Little Sarasota Bay; F. B. Meek (8694); H. Hemphill, 1884 (8677, 8678).

Tampa Bay; H. Hemphill, 1884 (8681).

Anclote Keys; E. Ingersoll, 1881 (12337).

Boca Ceiga Bay; H. Hemphill, 1884 (7519, 8686).

Cedar Keys; H. Hemphill, 1883 (8756).

West Florida; Kaiser and Martin (3018).

Marco; H. Hemphill (12856).

Garden Key, Tortugas; Lieut. H. G. Wright, U. S. N. (3543).

Tortugas; Wurdemann (3423); Col. Farquhar, 1880 (4472, 4473).

Gulf of Mexico; U. S. Fish Comm., 1885:

Off Apalachicola, Fla., 24 fath.; sta. 2407 (10683).

Off Cape Catoche, Yucatan, 25 fath.; sta. 2362 (10682).

West Indies; U. S. Fish Comm., 1884-'85:

Off Havana, Cuba, 98-216 fath. (14 stations).

San Antonio, Cuba (8411).

Jamaica (8409).

Saint Thomas (7516, 8407, 8408).

Yucatan; A. Schott (3234).

Caribbean Sea; U. S. Fish Comm., 1884:

Lat. 17° 44' 05" N., long. 75° 39' W., 23 fath., Cr., brk. Sh.; sta. 2138 (8415).

Curaçao Island (8826).

Sabanilla, U. S. of Colombia (8826).

HIPPONOË Gray.

82. *Hipponoë depressa* A. Agassiz.

Between Acapulco and Mazatlan, west coast of Mexico, Mexican Geogr. Comm. (12530).

83. *Hipponoë esculenta* A. Agassiz.

Bermuda; Bermuda Centennial Commissioners, 1876 (4477, 4478); Dr. F. V. Hamlin (5101).

Bahamas, U. S. Fish Comm., 1886: Nassau (14535, 14536), Abaco (14534).

Florida:

Indian Key; H. Hemphill (12935).

No Name Key; H. Hemphill, 1885 (14308).

Key West; U. S. Fish Comm., 1884 (8426).

Tortugas; Dr. J. B. Holder (3525).

Dry Tortugas Keys; E. Palmer, 1884 (8731, 8760).

Saint Thomas, West Indies; U. S. Fish Comm., 1884 (8828).

83. *Hipponoë esculenta* A. Agassiz—Continued.

Cozumel Island, Yucatan; U. S. Fish Comm., 1885 (10669).

Caribbean Sea; U. S. Fish Comm., 1884:

Old Providence Island (8830).

Curaçao Island (8427).

Sabanilla, U. S. of Colombia; U. S. Fish Comm., 1884 (8829).

84. *Hipponoë variegata* A. Agassiz.

Pacific Ocean:

Sandwich Islands; Wm. Stimpson, N. Pac. Expl. Exped. (3489).

Johnson's Island; D. S. Jordan (5948).

Palmyra Island; Dr. W. H. Jones, U. S. N. (8652, 8710).

Gilbert Islands (6990).

Tahiti; Dr. W. H. Jones, U. S. N., 1884 (12343).

Ousima, Japan; Wm. Stimpson, N. Pac. Expl. Exped. (2502).

EVECHINUS Verrill.

85. *Evechinus chloroticus* Verrill.

New Zealand:

I. Russell, U. S. Transit-of-Venus Exped., 1874-75 (3647).

Bluff Harbor (3631, 3638).

Suborder CLYPEASTRIDÆ Agassiz.

Family EUCLYPEASTRIDÆ Hæckel.

Subfamily FIBULARINA Gray.

ECHINOCYAMUS Van Phelsum.

86. *Echinocyamus pusillus* Gray.

Norway (3622); Bukken, Rev. A. M. Norman (7046).

Keilerbücht, Germany; C. Möbins (5181).

Off Fernandina, Fla., 270-294 fath., gy. S. brk. Cr.; U. S. Fish Comm., sta. 2666 (14544), 2668 (14545).

Off the Dry Tortugas, Florida; lat. 24° 15' N., long. 82° 13' W., 229 fath.; U. S. Coast Survey str. Blake, A. Agassiz, 1877-78 (6838).

Off Cuba; U. S. Fish Comm., 1885:

Off Havana, 201 fath., Cr.; sta. 2342 (10631).

Lat. 22° 35' N., long. 84° 23' W., 463 fath., Cr.; sta. 2352 (10632).

Off Yucatan; U. S. Fish Comm., 1885:

Off Arrowsmith Bank, 130 fath., Cr.; sta. 2354 (10623).

Off Cozumel Island, 231 fath., Cr.; sta. 2359 (10623).

Caribbean Sea, near Old Providence Island; lat. 13° 34' 45" N., long. 81° 21' 10" W., 382 fath., Cr. S.; U. S. Fish Comm., sta. 2150, 1884 (7117).

Off Grenadines, Windward Islands, 338 fath.; U. S. Coast Survey str. Blake, A. Agassiz, 1878-79 (6800).

FIBULARIA Lamarck.

87. *Fibularia volva* Agassiz.

North China Sea, 25 fath., shelly sand; Wm. Stimpson, N. Pac. Expl. Exped. (3581).

Subfamily ECHINANTHIDÆ A. Agassiz.

CLYPEASTER Lamarek.

88. *Clypeaster humilis* A. Agassiz.

Mindanao, Philippine Islands; Drayton (3436).

89. *Clypeaster latissimus* A. Agassiz.

Off St. Vincent, Windward Islands, 95 fath.; U. S. Coast Survey str. Blake, A. Agassiz, sta. 231, 1878-79 (6825).

90. *Clypeaster Ravenellii* A. Agassiz.

Atlantic Ocean, off South Carolina; U. S. Fish. Comm., 1885:

Lat. $33^{\circ} 15' 30''$ N., long. $77^{\circ} 07'$ W., 95 fath., S.; sta. 2417 (10058).

Lat. $32^{\circ} 54'$ N., long. $77^{\circ} 53' 30''$ W., 88 fath., crs. S.; sta. 2312 (10055).

Lat. $32^{\circ} 53'$ N., long. $77^{\circ} 53'$ W., 99 fath., crs. S.; sta. 2313 (10056).

Off Key West, Fla.; U. S. Fish Comm., 1885:

Lat. $24^{\circ} 25' 45''$ N., long. $81^{\circ} 46' 45''$ W., 45 fath., Cr.; sta. 2317 (10675).

Lat. $24^{\circ} 25' 45''$ N., long. $81^{\circ} 46'$ W., 45 fath., Cr.; sta. 2318 (10643).

Gulf of Mexico; U. S. Fish Comm., 1885:

Lat. $29^{\circ} 24' 30''$ N., long. $88^{\circ} 01'$ W., 35 fath., S.; sta. 2388 (10054).

Lat. $28^{\circ} 44'$ N., long. $85^{\circ} 16'$ W., 60 fath., S.; sta. 2404 (10626, 10644).

Lat. $28^{\circ} 42' 30''$ N., long. $85^{\circ} 29'$ W., 88 fath., M.; sta. 2403 (10057).

Gulf of Mexico; lat. $23^{\circ} 20'$ N., long. $89^{\circ} 16'$ W., 84 fath.; U. S. Coast Survey str. Blake, A. Agassiz, sta. 36, 1877-78 (6830).

91. *Clypeaster rotundus* A. Agassiz.

Lower California; Commander Dewey, U. S. N. (3614).

Las Animas Bay, Gulf of California; R. E. C. Stearns (10005).

Unknown locality; flat variety (2631).

92. *Clypeaster scutiformis* Lamarek.

Unknown locality (2552).

93. *Clypeaster subdepressus* Agassiz.

Off the southern and western coasts of Florida; U. S. Fish Comm., 1885:

Lat. $24^{\circ} 25' 45''$ N., long. $81^{\circ} 46' 45''$ W., 45 fath., Cr.; sta. 2317 (10676).

Lat. $25^{\circ} 04' 30''$ N., long. $82^{\circ} 59' 15''$ W., 26 fath., S.; sta. 2414 (8993).

Lat. $26^{\circ} 33' 30''$ N., long. $83^{\circ} 15' 30''$ W., 27 fath., S.; sta. 2411 (8994).

Gulf of Mexico; U. S. Fish Comm., 1885:

Lat. $29^{\circ} 10'$ N., long. $85^{\circ} 31'$ W., 30 fath., S.; sta. 2375 (8995).

Lat. $29^{\circ} 24' 30''$ N., long. $88^{\circ} 01'$ W., 35 fath., S.; sta. 2388 (8992).

Off Cape Catoche, Yucatan; lat. $22^{\circ} 08' 30''$ N., long. $86^{\circ} 53' 30''$ W., 25 fath., Cr. S.; U. S. Fish Comm., sta. 2362, 1885 (10625).

ECHINANTHUS Breyn.

94. *Echinanthus rosaceus* Gray.

Bahamas, U. S. Fish Comm., 1886: Nassau (14527), Abaco (14526).

Florida:

(3091); L. F. Pourtalès (4101).

Key Biscayne; Wurdemann (2480).

Indian Key; H. Hemphill (12936).

Key Vaccas; H. Hemphill, 1885 (14311).

Key West; U. S. Fish Comm., 1884 (8417).

West Indies; U. S. Fish Comm., 1884:

San Antonio, Cnba (8418).

St. Thomas (8419, 8420).

West Indies; Dr. John Gibson, U. S. N. (12340).

95. Echinanthus testudinarius Gray.

Hakodadi, Japan; W. J. Fisher (3435, 3577, 8977).

Kanada Bay, Nippon, Japan; W. J. Fisher (14037).

La Paz, Lower California; A. Forrer (10018); L. Belding, 1882 (5395).

• Subfamily LAGANIDÆ Desor.

LAGANUM Klein.*

96. Laganum Bonani Klein.

Sooloo Sea; U. S. Expl. Exped. (2551).

Mangsi Island, Pacific Ocean; U. S. Expl. Exped. (2549).

97. Laganum depressum Lesson.

Sandwich Islands; Pease (2387).

Tongatabu, Friendly Islands; U. S. Expl. Exped. (2526).

New Zealand (3606).

Unknown localities (2531, 2537, 2538, 2540, 2546, 3537, 8773).

98. Laganum Putnami Barnard.

Ousima, Japan; Wm. Stimpson, N. Pac. Expl. Exped. (3485).

Unknown locality (3476, 3486).

PERONELLA Gray.

99. Peronella decagonalis A. Agassiz.

Hong Kong, China; Wm. Stimpson, N. Pac. Expl. Exped. (1772).

Loo Choo Islands; Wm. Stimpson, N. Pac. Expl. Exped. (3482).

Unknown locality (2395).

Family SCUTELLIDÆ Agassiz.

ECHINARACHNIUS Leske.

100. Echinarachnius excentricus Valenciennes.

Straits of Fuca; "C. P.," U. S. Expl. Exped., 1838-'42 (2553).

Washington Territory:

Fort Steilacoom, Puget Sound; Dr. George Suckley, U. S. A. (2321).

Neeah Bay; J. G. Swan (6958).

California:

Crescent City; A. Agassiz (3576).

San Francisco; A. Agassiz (3546).

Monterey; D. S. Jordan, U. S. Fish Comm., 1880 (3773).

Monterey, 8-10 fath., M.; W. H. Dall (6884).

Monterey, 8-12 fath.; W. H. Dall (8781).

San Fernando Mountains, Santa Barbara Co., 15 miles from the sea, altitude 1,700 feet (fossil); W. H. Dall (14035).

San Miguel Island; W. H. Dall (6883).

Santa Catalina Island; W. H. Dall (5941).

New Anaheim Landing; W. H. Dall (14036).

San Diego; D. S. Jordan, U. S. Fish Comm., 1880 (3752); Orentt (12338).

Off San Diego; Mus. Comp. Zool. (6807).

Mulege Bay, Gulf of California; W. J. Fisher (8989).

Mr. Alexander Agassiz* records *Echinarachnius excentricus* from Sitka and Unalash, Alaska, and Kamtehatka, on the authority of Eschscholtz. The very large collection of Echini in the National Museum from Alaska and Eastern Siberia does not contain any representatives of this species, and Eschscholtz's observations were probably based upon some other form. There is no positive evidence that *E. excentricus* extends north of Puget Sound and the Straits of Fuca, although *E. parma* is very common throughout Alaska, and in some places attains a very large size.

101. *Echinarachnius mirabilis* A. Agassiz.

Hakodadi, Japan; U. S. S. Tuscarora (3252).

102. *Echinarachnius parma* Gray.

Labrador: L'anse au Loup, 15 fath.; W. A. Stearns, 1882 (5932).

Nova Scotia; Willis (2383).

New Brunswick: Grand Manan; W. Stimpson (2378, 2379, 2380).

Maine: Eastport (4112).

Massachusetts:

Off Cape Ann, 30 fath. (3483).

Lynn; Dr. Prescott (3479).

Cape Cod; William Stimpson (3585).

Massachusetts Bay; General J. G. Totten (3477, 8776).

Off Newport, 24 fath.; U. S. Coast Survey str. Blake, A. Agassiz (6822).

Off the eastern coast of North America; U. S. Fish Comm.:

Off the southern edge of the Grand Bank of Newfoundland, 129-179 fath., S. P.; sta. 2430 (11036); sta. 2431 (11037).

NE. part of the Grand Bank, 35-39 fath., wh. S. brk. Sh. (3 stations).

Off the SE. coast of Newfoundland, 89 fath., S. gn. M.; sta. 2458 (11041).

Green Bank, 30-67 fath., S. brk. Sh. (3 stations).

Between Bank of St. Pierre and Banquereau, 116 fath., G.; sta. 2481 (11045).

Banquereau, 75 fath. (4795).

Halifax Harbor, 16-37 fath., S., 1877 (13207, 13644, 13645).

Gulf of Maine, lat. 42° 44' N., long. 66° 27' W., 75 fath., S. M.; sta. 39, 1877 (13643).

Off Cape Ann, 21-26 fath., S. M. R. G., 1878 (several stations).

Gloucester Harbor, 8½ fath., S., 1878 (13704).

Stellwagen's Bank, 13-17 fath., S., 1879 (13591).

Cape Cod Bay, 6-31 fath., S. G., 1879 (many stations).

Off Cape Cod, 10-34 fath., S. G., 1879, 1881 (many stations).

George's Bank region, 37-86 fath., S. G. (5 stations).

Off Nantucket Shoals, 18-25 fath., S. (2 stations).

Vineyard Sound, Mass., 1875 (3695, 4309).

Off Martha's Vineyard, Mass., 28-69 fath., S. M. (5086, 6197).

North of Block Island, 15 fath., S.; 1880 (13599).

Narragansett Bay, R. I., 8¼ fath., S. Sh., 1880 (9692).

Noank, Conn., 1874 (4978).

Off the coast of Maryland, 19 fath., S.; sta. 2015 (6365, 6572, 8653).

Off Chesapeake Bay, 70 fath., M. G.; sta. 2265 (8521).

Alaska; William H. Dall, 1871-1880:

Near Point Belcher, 9 fath., S. (14314).

Icy Cape, 7-15 fath., S. (8649, 8664).

* Revision of the Echini, p. 107.

102. *Echinarachnius parma* Gray—Continued.

Alaska: William H. Dall, 1871-1880—Continued.

Lat. $66^{\circ} 45' N.$, long. $166^{\circ} 35' W.$, 10 fath., S. (7127).

Point Spencer, Port Clarence (6954).

Off King's Island, Bering Strait, 17 fath., M. (8707, 8838).

Off Nunivak Island, 24 fath., S. (8660).

St. Paul's Island (6882).

St. George Island (6885).

Attu, 5-7 fath., S. G. (8706).

Atka, 10-16 fath., S. (8683).

Unalashka (6946, 8655, 8716, 8728, 10040); Ilinink Harbor, 3-6 fath., S. R. (8662, 8740, 12852); Captain's Harbor (8705, 8839); between Pinnacle and Ulakhla, 16 fath. (14042).

Unga (8723); Coal Harbor, 8-9 fath., M. S. St. (8663, 8836, 8837).

Unga Island and Popoff Straits (8717, 12851, 12853).

Chiachi Island, 20 fath., M. (14043).

Shumagins: Sanborn Harbor, 6-8 fath., S. (8665); Koniussha Island (14044).

Alaska: Chignick Bay (6947).

Semidi Islands, 15-25 fath., G. (8661).

Chirikoff Island, 9-14 fath., S. (6948, 7028, 8738).

Kodiak: St. Paul (6949); Chajadisa Cove, 13 fath., M. (8835).

Cook's Inlet: Chugachik Bay, 20-60 fath., S. M. (8640).

Bering Sea; between lat. $60^{\circ} 16' N.$ and lat. $63^{\circ} 37' N.$, long. $165^{\circ} 19' W.$ and long. $168^{\circ} 45' W.$, 12-25 fath., S. M.; Lieut. G. M. Stoney, U. S. N., June, 1884 (6 stations).

St. Paul Island, H. W. Elliott, 1874 (6950).

British Columbia (?); C. B. R. Kennerly, North Western Boundary Survey (3006).

Kamtchatka: Bering Island; L. Stejneger, 1882-'83 (6959, 8639).

Echinarachnius parma attains, in some parts of Alaska, a much larger size than has yet been noted from the Atlantic coast of North America. Mr. Dall's collection contains especially large specimens from Nazan Bay, Atka (8683); Chignick Bay, Alaska (6947); and Unalashka (8716). One specimen from Nazan Bay measures, long. diameter 95^{mm} , trans. diameter 98^{mm} ; another from Chignick Bay measures, long. diameter 89^{mm} , trans. diameter 96^{mm} .

ECHINODISCUS Brey. n.

103. *Echinodiscus auritus* Leske.

Unknown locality (2392).

104. *Echinodiscus lævis* A. Agassiz.

Unknown locality (12336).

MELLITA Klein.

105. *Mellita longifissa* Michelin.

Angeles Bay, Gulf of California; W. J. Fisher, Stearns's Coll. (8988).

Mexico:

Mazatlan; A. Forrer (10016).

Acapulco; A. Agassiz (3474).

106. *Mellita pacifica* Verrill.

Cape St. Lucas, Lower California (?); John Xantus (2628).

Unknown localities (2626, 2627).

107. *Mellita sexforis* A. Agassiz.

West Indies: ? (4483); A. Agassiz (3584); St. Kitt's (7000).
 Old Providence Island, Caribbean Sea; U. S. Fish Comm., 1884 (8423).
 Rio de Janeiro, Brazil; R. Rathbun, 1876 (5388).

108. *Mellita testudinata* Klein.

Virginia:

Cherrystone; M. McDonald, U. S. Fish Comm., 1881 (4980, 5943).
 Hog Island; Wm. Stimpson (3531).

North Carolina:

Off Cape Hatteras, 7-25 fath., S.; U. S. Fish Comm., 1884 (9 stations).
 Beaufort; Wm. Stimpson (3025, 3530); W. K. Brooks (4302); H. C. Yarrow (4716).

Fort Macon; H. C. Yarrow (5083).

South Carolina: (3096, 3480); Hilton Head, F. V. Hayden (3513).

Florida (3505):

East coast; General Spinner, 1884 (10065).
 Sarasota Bay, 1-2 fath.; H. Hemphill, 1884 (8741).
 Sarasota Pass; H. Hemphill, 1884 (8818).
 Tampa Bay, 8 fath.; H. Hemphill, 1884 (8675).
 Tortugas; Col. Farquhar (4482).

Galveston, Texas: Dr. H. B. Butcher, U. S. A. (12339).

Vera Cruz, Mexico: Mexican Geogr. Comm. (12526).

Cumana, Venezuela: Couthouy (3509).

Bay of Bahia, Brazil: R. Rathbun, 1876 (5389).

ASTRICLYPEUS Verrill.**109. *Astriclypeus Manni* Verrill.**

North China Sea; Wm. Stimpson, N. Pac. Expl. Exped. (3517).

ROTULA Klein.**110. *Rotula Augusti* Klein.**

Unknown localities (2307, 6991).

ENCOPE Agassiz.**111. *Encope californica* Verrill.**

La Paz, Lower California; A. Forrer (10010).
 San Lucas Cove, Gulf of California; W. J. Fisher (8986).
 Chatham Island, Galapagos Islands; Dr. W. H. Jones, U. S. N., 1884 (8720).
 Unknown locality (2283).

The specimens from the Galapagos Islands (8720) are very large, the largest measuring $5\frac{2}{3}$ inches in longitudinal diameter.

112. *Encope emarginata* Agassiz.

Cumana, Venezuela; Couthouy (3607).
 Sabanilla, U. S. of Colombia; U. S. Fish Comm. str. Albatross, 1884 (8421, 8422).
 Unknown localities (2557, 3473).

113. *Encope grandis* Agassiz.

La Paz, Lower California; A. Forrer (10013).
 Angeles Bay, Gulf of California; W. J. Fisher (8985).

114. Encope Michelinii Agassiz.

Off Cape Lookout, N. C., 18-25 fath., S.; U. S. Fish Comm., 1885 (12940, 12949).

Off St. Augustine, Florida, 14 fath.; Postell (2285).

Rum Cay, Bahamas; U. S. Fish Comm., 1886 (14541).

Gulf of Mexico; U. S. Fish Comm., 1885:

Lat. $29^{\circ} 10' N.$, long. $85^{\circ} 31' W.$, 30 fath., S.; sta. 2375 (8954).Lat. $26^{\circ} 47' 30'' N.$, long. $83^{\circ} 25' 15'' W.$, 28 fath., S.; sta. 2410 (8955).

Off Cape Catoche, Yucatan; U. S. Fish Comm., 1885:

Lat. $22^{\circ} 08' 30'' N.$, long. $86^{\circ} 49' W.$, 26 fath., Cr.; sta. 2360 (10621).Lat. $22^{\circ} 08' 30'' N.$, long. $86^{\circ} 53' 30'' W.$, 25 fath., S. Cr.; sta. 2362 (10622).

Unknown localities (2289, 2295, 2296, 2298).

115. Encope micropora Agassiz.

Mazatlan, Mexico; A. Forrer, 1885 (10017).

Panama; Sternberg (3475).

Unknown localities (2279, 2284).

Suborder PETALOSTICHA Hæckel.

Family CASSIDULIDÆ Agassiz.

Subfamily ECHINONIDÆ Agassiz.

ECHINONÆUS Van Phelsum.

116. Echinonæus cyclostomus Leske.

Pacific Ocean:

Loo Choo Islands; Wm. Stimpson, N. Pac. Expl. Exped. (3450).

Gilbert Island (6995).

Unknown locality (2508).

Subfamily NUCLEOLIDÆ Agassiz.

NEOLAMPAS A. Agassiz.

117. Neolampas rostellata A. Agassiz.Near Key West, Florida; lat. $24^{\circ} 15' N.$, long. $82^{\circ} 13' W.$, 229 fath.; U. S.

Coast Survey str. Blake, A. Agassiz, sta. 5, 1877-78 (6790).

ECHINOLAMPAS Gray.

118. Echinolampas depressa Gray.Straits of Florida; lat. $25^{\circ} 04' 50'' N.$, long. $80^{\circ} 15' 10'' W.$, 56 fath., Cr. S.; U.

S. Fish Comm., sta. 2639, 1886 (14592).

Off Grenada, Windward Islands, 92 fath.; U. S. Coast Survey str. Blake, A.

Agassiz, sta. 253, 1878-79 (6815).

CONOLAMPAS A. Agassiz.

119. Conolampas Sigsbei A. Agassiz.

Off Havana, Cuba, U. S. Fish Comm., 1885; sta. 2350, 213 fath., Cr. (10645,

10766); sta. 2342, 201 fath., Cr. (10762).

Gulf of Mexico; lat. $25^{\circ} 52' N.$, long. $88^{\circ} 05' W.$, 95 fath.; U. S. Coast Survey

str. Blake, A. Agassiz, sta. 32, 1877-78 (6820).

RHYNCHOPYGUS D'Orbigny.

120. Rhynchopygus pacificus A. Agassiz.

Mexico:

Cape St. Lucas, Lower California; John Xantus (6988).

Acapulco; Mus. Comp. Zool. (3561).

Chatham Island, Galapagos Islands; Dr. W. H. Jones, U. S. N., 1884 (8750).

Family SPATANGIDÆ Agassiz.

Subfamily POURTALESIÆ A. Agassiz.

POURTALESIA A. Agassiz.

121. Pourtalesia Jeffreysi Wyv. Thomson.Atlantic Ocean, off George's Bank; lat. $40^{\circ} 16' 50''$ N., long. $67^{\circ} 05' 15''$ W., 1,290 fath., M. S.; U. S. Fish Comm., sta. 2084, 1884 (6255).

URECHINUS A. Agassiz.

122. Urechinus Naresianus A. Agassiz.Off George's Bank; lat. $41^{\circ} 43'$ N., long. $65^{\circ} 21' 50''$ W., 1,309 fath., M.; U. S. Fish Comm., sta. 2074, 1883 (7114).Off George's Bank; lat. $41^{\circ} 24' 45''$ N., long. $65^{\circ} 35' 30''$ W., 1,242 fath.; U. S. Coast Survey str. Blake, A. Agassiz, sta. 308, 1880 (6803).

Subfamily ANANCHYTIDÆ Alb. Gras.

PALÆOTROPUS Lovén.

123. Palæotropus Josephinæ Lovén.

Off Havana, Cuba, 143-182 fath., S. Cr.; U. S. Fish Comm., sta. 2327, 2341, 1885 (10634, 10635).

Off Barbados, Windward Islands, 140 fath.; U. S. Coast Survey str. Blake, A. Agassiz, sta. 299, 1878-'79 (6791).

PALÆOBRISSUS A. Agassiz.

124. Palæobrissus Hilgardi A. Agassiz.

Off Barbados, Windward Islands, 82 fath.; U. S. Coast Survey str. Blake, A. Agassiz, sta. 300, 1878-'79 (6812).

HOMOLAMPAS A. Agassiz.

125. Homolampas fragilis A. Agassiz.Caribbean Sea, near Aves Island; lat. $15^{\circ} 24' 40''$ N., long. $63^{\circ} 31' 30''$ W., 683 fath., M. fine. S.; U. S. Fish Comm., sta. 2117, 1884 (8397).

PALEOPNEUSTES A. Agassiz.

126. Paleopneustes cristatus A. Agassiz.

Off Havana, Cuba, 156 fath., Cr.; U. S. Fish Comm., sta. 2332, 2336, 1885 (10759, 10761).

Off Barbados, Windward Islands, 180 fath.; U. S. Coast Survey str. Blake, A. Agassiz, sta. 295, 1878-'79 (6828).

127. *Paleopneustes hystrix* A. Agassiz.

Off Havana, Cuba, 279 fath., Cr. ; U. S. Fish Comm., sta. 2343, 1885 (10648).
 Off Montserrat, Windward Islands, 120 fath. ; U. S. Coast Survey str. Blake, A. Agassiz, sta. 157, 1878-'79 (6826).

LINOPNEUSTES A. Agassiz.**128. *Linopneustes longispinus* A. Agassiz.**

North of Little Bahama Bank ; lat. $27^{\circ} 22' N.$, long. $78^{\circ} 07' 30'' W.$, 338 fath., gy. S. ; U. S. Fish Comm., sta. 2655, 1886 (14537).
 Off Havana, Cuba, U. S. Fish Comm. ; sta. 2157, 1884, 29 fath. (8428) ; sta. 2343, 1885, 279 fath., Cr. (10646).
 Off St. Kitts, West Indies, 208 fath. ; U. S. Coast Survey str. Blake, A. Agassiz, sta. 148, 1878-'79 (6818).

Subfamily SPATANGINA Gray.**SPATANGUS Klein.****129. *Spatangus purpureus* Leske.**

Shetland Islands ; A. M. Norman, 1884 (7017).
 Kielerbucht, Germany ; C. Möbius (3837).
 Atlantic Ocean, off Martha's Vineyard ; lat. $39^{\circ} 53' N.$, long. $69^{\circ} 43' W.$, 156 fath., fne. S. ; U. S. Fish Comm., sta. 1098, 1882 (5564).
 North of Little Bahama Bank ; lat. $27^{\circ} 22' N.$, long. $78^{\circ} 07' 30'' W.$, 338 fath., gy. S. ; U. S. Fish Comm., sta. 2655, 1886 (14594).

130. *Spatangus Raschi* Lovén.

Shetland Islands ; A. M. Norman, 1884 (7018).

MACROPNEUSTES Agassiz.**131. *Macropneustes spatangoides* A. Agassiz.**

Off St. Kitts, West Indies, 250 fath. ; U. S. Coast Survey str. Blake, A. Agassiz, 1878-'79 (6837).

MARETIA Gray.**132. *Maretia planulata* Gray.**

Gilbert Islands, Pacific Ocean (8715).
 Unknown locality (2564).

LOVENIA Desor.**133. *Lovenia cordiformis* Lütken.**

California ; W. H. Dall :
 Catalina Island, 40 fath. (3238).
 Catalina Harbor (12957).
 South of Catalina Island, 50 fath. (5938).
 Gulf of California ; Lieut. Comdr. H. E. Nichols, U. S. N., 1881 (8719).

BREYNIA Desor.**134. *Breynia australasiæ* Gray.**

Australia (2560).

ECHINOCARDIUM Gray.

135. *Echinocardium cordatum* Gray.

Scotland ; Anderson (3551).
 Dublin Bay, Ireland ; W. W. Walpole (8711).
 Salcombe, Devonshire, England ; Rev. A. M. Norman, 1884 (7011).
 Kielerbücht, Germany ; C. Möbius (3847).
 Cape Fear, North Carolina (3549).

136. *Echinocardium flavescens* A. Agassiz.

Bergen, Norway ; Bergen's Museum, 1884 (3580).
 Sweden ; Mus. Comp. Zool. (3504).
 Shetland Islands ; Rev. A. M. Norman, 1884 (7016).
 Kielerbücht, Germany ; C. Möbius (3846).

Subfamily BRISSINA Gray.

HEMIASTER Desor.

137. *Hemiasster cavernosus* A. Agassiz.

Tierra del Fuego, West Coast ; Dr. M. H. Crawford, U. S. N., 1884 (8718).
 Kerguelen Island ; Dr. J. H. Kidder, U. S. N., U. S. Transit-of-Venus Expedition,
 1874-75 (3144, 3232) ; types of *Hemiasster cordatus* Verrill.

138. *Hemiasster Mentzi* A. Agassiz.

Gulf of Mexico ; lat. $28^{\circ} 45' N.$, long. $88^{\circ} 15' 30'' W.$, 940 fath., M. ; U. S. Fish
 Comm., sta. 2384, 1885 (10647).

BRISSOPSIS Agassiz.

139. *Brissoopsis lyrifera* Agassiz.

Shetland Islands ; Rev. A. M. Norman (7015).
 Bergen, Norway ; Bergen's Museum (8582).
 Kielerbücht, Germany ; C. Möbius (3838).
 Atlantic Ocean, off the coast of the United States ; U. S. Fish Comm., 1883-85 :
 Lat. $41^{\circ} 09' 40'' N.$, long. $66^{\circ} 02' 20'' W.$, 1,255 fath., M. ; sta. 2077 (6996,
 7118).
 Lat. $40^{\circ} 09' 30'' N.$, long. $67^{\circ} 09' W.$, 1,356 fath., gy. glb. O. ; sta. 2571 (12143).
 Lat. $39^{\circ} 49' N.$, long. $68^{\circ} 28' 30'' W.$, 1,467 fath., glb. O. ; sta. 2043 (8667).
 Lat. $39^{\circ} 47' 20'' N.$, long. $69^{\circ} 34' 15'' W.$, 924 fath., gy. M. ; sta. 2217 (7934).
 Lat. $39^{\circ} 46' 22'' N.$, long. $69^{\circ} 29' W.$, 948 fath., gy. M. ; sta. 2218 (7935).
 Lat. $39^{\circ} 34' 45'' N.$, long. $71^{\circ} 31' 30'' W.$, 1,080 fath., M. S. ; sta. 2209 (7823).
 Lat. $39^{\circ} 33' N.$, long. $71^{\circ} 16' 15'' W.$, 1,178 fath., M. ; sta. 2208 (7822).
 Lat. $39^{\circ} 22' N.$, long. $71^{\circ} 23' 30'' W.$, 1,396 fath., gy. O. ; sta. 2564 (12144).
 Lat. $39^{\circ} 15' 30'' N.$, long. $71^{\circ} 25' W.$, 1,434 fath., gy. O. ; sta. 2562 (12142).
 Lat. $38^{\circ} 27' N.$, long. $73^{\circ} 02' W.$, 1,168 fath., gy. O. ; sta. 2230 (8102, 8148).
 Lat. $37^{\circ} 50' N.$, long. $73^{\circ} 03' 50'' W.$, 1,395 fath., glb. O. ; sta. 2105 (6604,
 7113).
 Lat. $37^{\circ} 38' 40'' N.$, long. $73^{\circ} 16' 30'' W.$, 1,423 fath., glb. O. ; sta. 2229 (8197).
 Lat. $37^{\circ} 25' N.$, long. $73^{\circ} 06' W.$, 1,582 fath., M. ; sta. 2228 (8147, 10049).
 Between Capes Hatteras and Lookout, N. C., 87-124 fath., S. P., 1885 (12947)

139. *Brissopsis lyrifera* Agassiz—Continued.

Gulf of Mexico; U. S. Fish Comm., 1885:

Off Havana, Cuba, 279 fath., Cr.; sta. 2343 (10636).

Lat. $28^{\circ} 44' N.$, long. $85^{\circ} 16' W.$, 60 fath., S.; sta. 2404 (10633).

Lat. $28^{\circ} 36' N.$, long. $85^{\circ} 33' 30'' W.$, 111 fath., M.; sta. 2402 (10627).

Lat. $28^{\circ} 38' 30'' N.$, long. $85^{\circ} 52' 30'' W.$, 142 fath., M.; sta. 2401 (10640).

Lat. $28^{\circ} 41' N.$, long. $86^{\circ} 07' W.$, 169 fath., M.; sta. 2400 (10639).

Lat. $28^{\circ} 05' N.$, long. $87^{\circ} 56' 15'' W.$, 1,330 fath., M.; sta. 2381 (10638).

Lat. $29^{\circ} 14' 30'' N.$, long. $88^{\circ} 09' 30'' W.$, 68 fath., M.; sta. 2378 (10637).

Gulf of Mexico, off the mouth of the Mississippi River; lat. $28^{\circ} 51' 30'' N.$, long. $89^{\circ} 01' 30'' W.$, 118 fath.; U. S. Coast Survey str. Blake, A. Agassiz, sta. 49, 1877-78 (6313, 6827).

Caribbean Sea, off Jamaica; lat. $17^{\circ} 55' N.$, long. $76^{\circ} 41' 20'' W.$, 150 fath.; U. S. Coast Survey str. Blake, A. Agassiz, sta. 116, 1878-79 (6816).

Off Aspinwall, Panama, 25 fath., M.; U. S. Fish Comm., sta. 2145, 1884 (7117).

ACESTE Wyv. Thomson.

140. *Aceste bellidifera* Wyv. Thomson.

Atlantic Ocean, off Maryland; lat. $37^{\circ} 41' 20'' N.$, long. $73^{\circ} 03' 20'' W.$, 1,497 fath., glb. O.; U. S. Fish Comm., sta. 2106, 1883 (6700).

Caribbean Sea, off Aves Island; lat. $15^{\circ} 24' 40'' N.$, long. $63^{\circ} 31' 30'' W.$, 683 fath., M. fne. S.; U. S. Fish Comm., sta. 2117, 1884 (7115).

AGASSIZIA Valenciennes.

141. *Agassizia excentrica* A. Agassiz.

Straits of Florida; lat. $25^{\circ} 05' N.$, long. $80^{\circ} 15' W.$, 56 fath., Cr. S.; U. S. Fish Comm., sta. 2640, 1886 (14593).

Off Havana, Cuba; U. S. Fish Comm.:

Sta. 2159, 1884, 98 fath. (8400).

Sta. 2341, 1885, 143 fath. (10629).

Sta. 2345, 1885, 184 fath. (10630).

Off the Windward Islands; U. S. Coast Survey str. Blake, A. Agassiz, 1878-79:

Off Barbados, 76 fath. (6792).

Off Dominica, 118 fath. (6793).

142. *Agassizia scrobiculata* Valenciennes.

La Paz, Lower California; L. Belding (5394).

San Lucas Cove, Gulf of California; W. J. Fisher (10008).

Mazatlan, Mexico; A. Forrer (10019).

Panama; A. Agassiz (3550).

BRISSUS Klein.

143. *Brissus carinatus* Gray.

Pacific Ocean:

Sandwich Islands (?); U. S. Expl. Exped. (2562).

Marquesas Islands; Dr. W. H. Jones, U. S. N., 1884 (8702).

Paumotu islands (8691).

Tahiti, Society Islands (8690).

METALIA Gray.

144. *Metalia pectoralis* A. Agassiz.

Bahamas; B. H. Van Vleck (10852); Nassau, U. S. Fish Comm., 1886, one fine large living specimen (14539).

Off Cape Catoche, Yucatan, 25 fath., S. Cr.; U. S. Fish Comm., sta. 2362, 1885 (10624).

Unknown locality (2596).

145. *Metalia sternalis* Gray.

Sandwich Islands; Mus. Comp. Zoology (3060).
Unknown locality (2524).

MEOMA Gray.**146. *Meoma grandis* Gray.**

La Paz, Lower California; L. Belding, 1882 (5392).
Unknown localities (2514, 2518, 3615).

147. *Meoma ventricosa* Lütken.

Nassau, Bahamas; U. S. Fish. Comm., 1886 (14538).

Gulf of Mexico; U. S. Fish. Comm., 1885:

Off the Dry Tortugas, 26 fath., S.; sta. 2414 (8999).

Off Charlotte Harbor, Fla., 27 fath., S.; sta. 2411, 2412 (8998, 9000).

Off Apalachicola, Fla., 26-30 fath., S. Cr.; sta. 2405, 2406 (8996, 8997, 10620).

Off Cape Catoche, Yucatan, 25 fath., S.; sta. 2362 (10619).

SCHIZASTER Agassiz.**148. *Schizaster canaliferus* Agassiz.**

Atlantic Ocean, off Martha's Vineyard; lat. $40^{\circ} 02' N.$, long. $70^{\circ} 37' 30'' W.$, 101 fath., M. fine. S.; U. S. Fish. Comm., sta. 1108, 1882 (5563).

149. *Schizaster fragilis* Agassiz.

Hardangerfjord, Norway; Bergen's Museum (8596).

Atlantic Ocean, off the eastern coast of North America; U. S. Fish. Comm.:

Off the Grand Bank of Newfoundland, 150 fath. (4940).

Off the southern edge of the Grand Bank, 471 fath., gy. M., 1885 (12128).

Between Bank of St. Pierre and Banquereau, 116-224 fath., M. S. G., 1885 (6 stations).

Eastern edge of Banquereau, 39 fath., S. G., 1885 (12331).

South of Nova Scotia, 93-190 fath., M. G., 1877, 1885 (9680, 11305, 12126, 12136).

30 miles S. E. $\frac{1}{2}$ S. of Cape Sable, N. S., 88-91 fath., fine. S. M., 1877 (5951, 7120, 13414).

Jeffrey's Bank, Gulf of Maine (4903).

23 miles E. by S. of Eastern Point Light, Cape Ann, Mass., 85-110 fath., M. G., 1878 (9867).

Off Cape Cod, Mass., 80-129 fath., M., 1879 (13417-13419).

Off the northern edge of George's Bank, 99-150 fath., M. S. G., 1883-1885 (7112, 7121-7124).

East of George's Bank; lat. $41^{\circ} 49' N.$, long. $65^{\circ} 49' 30'' W.$, 72 fath., S. G., 1885 (12132).

Southeast of George's Bank; lat. $39^{\circ} 56' 45'' N.$, long. $70^{\circ} 50' 30'' W.$, 156 fath., M. fine. S., 1885 (12133).

Off Martha's Vineyard, Mass.; between lat. $39^{\circ} 49' N.$ and $40^{\circ} 03' N.$, long. $68^{\circ} 56' W.$ and $71^{\circ} 43' W.$; 120-321 fath., M. S. Sh., 1880-1885 (19 stations).

South of Long Island, N. Y.; between lat. $38^{\circ} 53' 30'' N.$ and $39^{\circ} 33' N.$, long. $72^{\circ} 18' 30'' W.$ and $72^{\circ} 52' W.$; 188-452 fath., M. S., 1884, 1885 (7713, 7717, 12294, 12297).

Off Cape Lookout, N. C.; lat. $34^{\circ} 39' 15'' N.$, long. $75^{\circ} 33' 30'' W.$, 107 fath., gy. S. P., 1885 (12946).

150. Schizaster Orbignyanus A. Agassiz.

South of Martha's Vineyard, Mass.; lat. $40^{\circ} 02' 54''$ N., long. $70^{\circ} 23' 40''$ W., 115 fath., M. fine. S.; U. S. Fish Comm., sta. 871, 1880 (13312).

PERIASTER D'Orbigny.

151. Periaster limicola A. Agassiz.

Gulf of Mexico; U. S. Fish Comm., 1885:

Lat. $29^{\circ} 14' 30''$ N., long. $88^{\circ} 09' 30''$ W., 68 fath., M.; sta. 2378 (10641).

Lat. $23^{\circ} 38' 30''$ N., long. $85^{\circ} 52' 30''$ W., 142 fath., M.; sta. 2401 (10642).

MOIRA A. Agassiz.

152. Moira atropos A. Agassiz.

Eastern coast, United States:

North Carolina (1753).

Charleston, South Carolina; William Stimpson (3497).

Pine Key, Florida; Henry Hemphill (6989).

Unknown localities (2515, 2517, 2520, 2521, 6998).

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